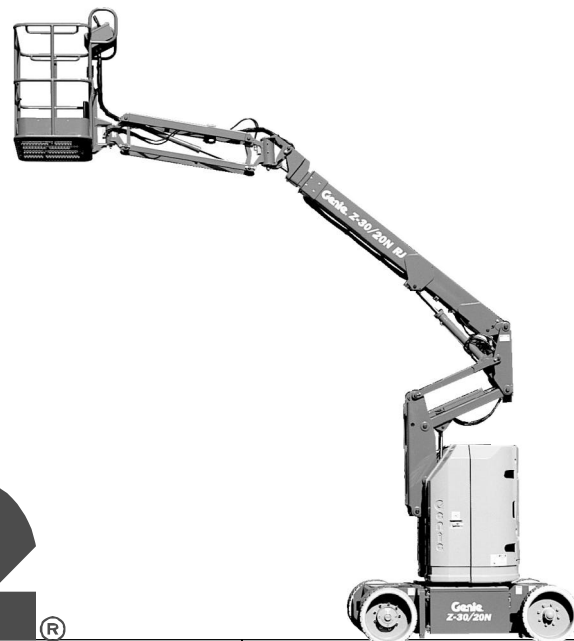




## Service Manual

*Refer to inside cover for additional serial number information*

Part No. 106373

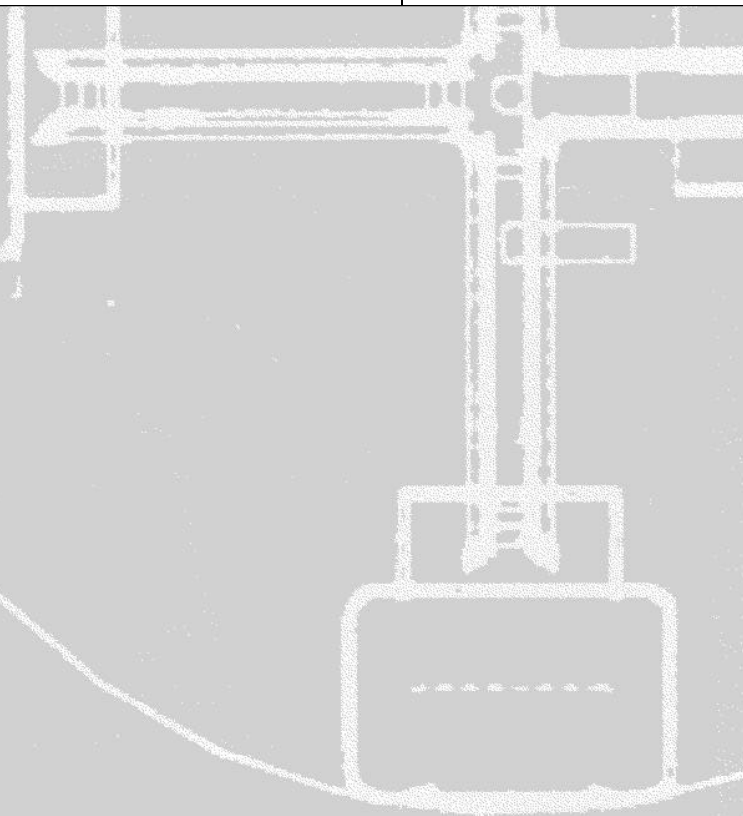
Rev A2

March 2006

### **Z<sup>TM</sup>-30/20N**

*including rotating jib models*

*(from serial number 5934)*



---

## Important

Read, understand and obey the safety rules and operating instructions in the *Genie Z-30/20N Operator's Manual* before attempting any maintenance or repair procedure.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting fault codes and repair procedures for qualified service professionals.

Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, we strongly recommend that maintenance and repair be performed at an authorized Genie dealer service center.

---

## Technical Publications

Genie Industries has endeavored to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Genie policy. Therefore, product specifications are subject to change without notice.

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and all other manuals.

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## Contact Us:

<http://www.genieindustries.com>  
e-mail: [techsup@genieind.com](mailto:techsup@genieind.com)

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## Serial Number Information

Genie Industries offers the following Service Manuals for these models:

| Title                                                        | Part No. |
|--------------------------------------------------------------|----------|
| Z-30/20N Service Manual<br>(before serial number 5934) ..... | 35532    |

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106373 Rev A April 2004

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# Safety Rules



## Danger

Failure to obey the instructions and safety rules in this manual and the *Genie Z-30/20N Operator's Manual* will result in death or serious injury.

Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

## Do Not Perform Maintenance Unless:

- ☒ You are trained and qualified to perform maintenance on this machine.
- ☒ You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules and worksite regulations
  - applicable governmental regulations
- ☒ You have the appropriate tools, lifting equipment and a suitable workshop.

## SAFETY RULES

**Personal Safety**

Any person working on or around a machine must be aware of all known safety hazards. Personal safety and the continued safe operation of the machine should be your top priority.



Read each procedure thoroughly. This manual and the decals on the machine, use signal words to identify the following:



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**▲ DANGER**

Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**▲ WARNING**

Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**▲ CAUTION**

With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

**CAUTION**

Without safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

**NOTICE**

Indicates special operation or maintenance information.



Be sure to wear protective eye wear and other protective clothing if the situation warrants it.



Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

**Workplace Safety**

Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.



Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.



Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.



Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.



Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.



Be sure that your workshop or work area is properly ventilated and well lit.

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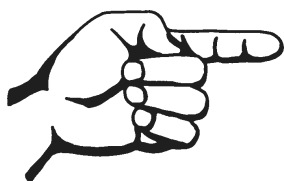
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REV C

# Specifications

## Machine Specifications

### Tires and wheels

|                          |                                     |
|--------------------------|-------------------------------------|
| Tire size (solid rubber) | 22 x 7 x 18.4 in<br>56 x 18 x 47 cm |
| Load range               | 7600 lbs<br>3447 kg                 |
| Tire contact area        | 35 sq in<br>226 sq cm               |
| Overall tire diameter    | 22 in<br>56 cm                      |
| Wheel diameter           | 18.4 in<br>47 cm                    |
| Wheel width              | 7 in<br>18 cm                       |

### Wheel lugs

|                            |                        |
|----------------------------|------------------------|
| Front                      | 8 @ $\frac{5}{8}$ -18  |
| Rear                       | 9 @ $\frac{5}{8}$ -18  |
| Lug nut torque, dry        | 125 ft-lbs<br>169.5 Nm |
| Lug nut torque, lubricated | 94 ft-lbs<br>127.4 Nm  |

### Fluid Capacities

|                                                                                              |                             |
|----------------------------------------------------------------------------------------------|-----------------------------|
| Hydraulic tank capacity                                                                      | 4 gallons<br>15.1 liters    |
| Hydraulic system capacity (including tank)                                                   | 6 gallons<br>22.7 liters    |
| Drive hubs                                                                                   |                             |
| 61:1                                                                                         | 23 ounces      0.68 liter   |
| 62.5:1                                                                                       | 25.6 ounces      0.76 liter |
| Drive hub oil type:<br>SAE 90 multipurpose hypoid gear oil API service<br>classification GL5 |                             |

**Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.**

## Performance Specifications

### Drive speed, maximum

|                         |                                                            |
|-------------------------|------------------------------------------------------------|
| Stowed position         | 3.3 mph<br>5.3 km/h<br>40 ft / 8.3 sec<br>12.2 m / 8.3 sec |
| Boom raised or extended | 0.6 mph<br>1 km/h<br>40 ft / 44 sec<br>12.2 m / 44 sec     |

### Braking distance, maximum

|                             |                          |
|-----------------------------|--------------------------|
| High range on paved surface | 2 to 4 ft<br>0.6 to 1.2m |
|-----------------------------|--------------------------|

|                     |                       |
|---------------------|-----------------------|
| <b>Gradeability</b> | See Operator's Manual |
|---------------------|-----------------------|

### Boom function speeds, maximum from platform controls (with rated load secured to platform)

|                                                        |                  |
|--------------------------------------------------------|------------------|
| Jib boom up                                            | 26 to 32 seconds |
| Jib boom down                                          | 23 to 29 seconds |
| Jib boom rotate, 200°<br>(before serial number 8333)   | 12 to 18 seconds |
| Jib boom rotate, 180°<br>(after serial number 8332)    | 12 to 18 seconds |
| Primary boom up                                        | 14 to 22 seconds |
| Primary boom down                                      | 12 to 20 seconds |
| Primary boom extend<br>(models with rotating jib boom) | 14 to 24 seconds |
| (models without rotating jib boom)                     | 9 to 15 seconds  |
| Primary boom retract                                   | 12 to 18 seconds |
| Secondary boom up                                      | 11 to 18 seconds |
| Secondary boom down                                    | 7 to 15 seconds  |
| Turntable rotate, 355°                                 | 50 to 65 seconds |
| Platform rotate, 160°                                  | 5 to 11 seconds  |
| Platform level up                                      | 14 to 19 seconds |
| Platform level down                                    | 13 to 18 seconds |

## SPECIFICATIONS

REV B

## Hydraulic Specifications

### Hydraulic Oil Specifications

|                            |                             |
|----------------------------|-----------------------------|
| Hydraulic oil type         | Chevron Rykon MV equivalent |
| ISO viscosity grade        | Multi-viscosity             |
| Viscosity index            | 200                         |
| Cleanliness level, minimum | 15/13                       |
| Water content, maximum     | 200 ppm                     |

**Chevron Rykon MV oil is fully compatible and mixable with Shell Donax TG (Dexron III) oils.**

Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and have a minimum viscosity index of 150. They should provide excellent antiwear, oxidation, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

### Optional fluids

|                |                                                                              |
|----------------|------------------------------------------------------------------------------|
| Biodegradable  | Petro Canada Premium ECO 46<br>Statoil Hydra Way Bio Pa 32<br>BP Biohyd SE-S |
| Fire resistant | UCON Hydrolube HP-5046<br>Quintolubric 822                                   |
| Mineral based  | Shell Tellus T32<br>Shell Tellus T46<br>Chevron Aviation A                   |

**NOTICE** Use Chevron Aviation A hydraulic oil when in ambient temperatures consistently below 0°F / -18°C.

**NOTICE** Use Shell Tellus T46 hydraulic oil when oil temperatures consistently exceed 205°F / 96°C.

**NOTICE** Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult the Genie Industries Service Department before use.

### Function pump

|                                   |                                           |
|-----------------------------------|-------------------------------------------|
| Type:                             | Fixed displacement gear pump              |
| Displacement                      | 0.183 cu in<br>3 cc                       |
| Flow rate @<br>2800 psi / 172 bar | 2.1 gpm<br>7.9 L/min                      |
| Hydraulic tank<br>return filter   | 10 micron with<br>25 psi / 1.7 bar bypass |

### Function manifold

|                                                                    |                     |
|--------------------------------------------------------------------|---------------------|
| System relief valve pressure                                       | 2800 psi<br>193 bar |
| Primary boom down relief pressure                                  | 1600 psi<br>110 bar |
| Secondary boom down relief pressure                                | 1600 psi<br>110 bar |
| Primary boom extend relief pressure<br>Models without rotating jib | 2800 psi<br>193 bar |
| Primary boom extend relief pressure<br>Models with rotating jib    | 1800 psi<br>124 bar |
| Turntable rotate relief pressure                                   | 1100 psi<br>76 bar  |

### Auxiliary pump

|              |                              |
|--------------|------------------------------|
| Type:        | Fixed displacement gear pump |
| Displacement | 0.3 gpm<br>1.14 L/min        |

REV C

SPECIFICATIONS

## Manifold Component Specifications

### Plug torque

|            |                   |
|------------|-------------------|
| SAE No. 2  | 36 in-lbs / 4 Nm  |
| SAE No. 4  | 10 ft-lbs / 13 Nm |
| SAE No. 6  | 14 ft-lbs / 19 Nm |
| SAE No. 8  | 38 ft-lbs / 51 Nm |
| SAE No. 10 | 41 ft-lbs / 55 Nm |
| SAE No. 12 | 56 ft-lbs / 76 Nm |

### Valve Coil Resistance Specification

| Description                                                                                   | Specification |
|-----------------------------------------------------------------------------------------------|---------------|
| Solenoid valve, 3 position 4 way, 20V DC<br>(schematic items A, J, K, U, V, Y, AA, BB and CC) | 22 $\Omega$   |
| Proportional solenoid valve, 24V DC<br>(schematic item H)                                     | 19.5 $\Omega$ |
| Solenoid valve, N.C. poppet, 20V DC<br>(schematic item M)                                     | 23.5 $\Omega$ |
| Solenoid valve, N.O. poppet, 20V DC<br>(schematic item P)                                     | 23.5 $\Omega$ |

## Machine Torque Specifications

### Platform rotator and jib boom rotator (Z-30/20NRJ)

|                               |                      |
|-------------------------------|----------------------|
| 1-8 center bolt, GR 8         | 480 ft-lbs<br>651 Nm |
| $\frac{3}{8}$ -16 bolts, GR 8 | 44 ft-lbs<br>60 Nm   |

### Turntable rotate bearing

|                                           |                      |
|-------------------------------------------|----------------------|
| Rotate bearing mounting bolts, lubricated | 180 ft-lbs<br>244 Nm |
|-------------------------------------------|----------------------|

### Drive hubs, brakes and motors

|                                      |                      |
|--------------------------------------|----------------------|
| Drive hub mounting bolts, lubricated | 180 ft-lbs<br>244 Nm |
| Brake mounting bolts, lubricated     | 93 ft-lbs<br>126 Nm  |
| Drive motor mounting bolts           | 31 ft-lbs<br>42 Nm   |

## SPECIFICATIONS

REV B

## Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

### SAE O-ring Boss Port

(tube fitting - installed into Aluminum)

| SAE Dash size | Torque                |
|---------------|-----------------------|
| -4            | 11 ft-lbs / 14.9 Nm   |
| -6            | 23 ft-lbs / 31.2 Nm   |
| -8            | 40 ft-lbs / 54.2 Nm   |
| -10           | 69 ft-lbs / 93.6 Nm   |
| -12           | 93 ft-lbs / 126.1 Nm  |
| -16           | 139 ft-lbs / 188.5 Nm |
| -20           | 172 ft-lbs / 233.2 Nm |
| -24           | 208 ft-lbs / 282 Nm   |

### SAE O-ring Boss Port

(tube fitting - installed into Steel)

| SAE Dash size | Torque                |
|---------------|-----------------------|
| -4            | 16 ft-lbs / 21.7 Nm   |
| -6            | 35 ft-lbs / 47.5 Nm   |
| -8            | 60 ft-lbs / 81.3 Nm   |
| -10           | 105 ft-lbs / 142.4 Nm |
| -12           | 140 ft-lbs / 190 Nm   |
| -16           | 210 ft-lbs / 284.7 Nm |
| -20           | 260 ft-lbs / 352.5 Nm |
| -24           | 315 ft-lbs / 427.1 Nm |

### Seal-Lok® fittings

- 1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

#### NOTICE

The O-rings used in the Parker Seal Lok® fittings and hose ends are custom-size O-rings. They are not standard SAE size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

- 2 Lubricate the O-ring before installation.
- 3 Be sure that the face seal O-ring is seated and retained properly.
- 4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.
- 5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table.
- 6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

### Seal-Lok® Fittings

(hose end)

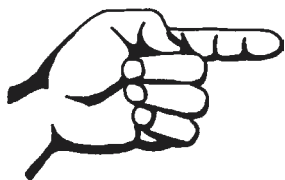
| SAE Dash size | Torque              |
|---------------|---------------------|
| -4            | 18 ft-lbs / 25 Nm   |
| -6            | 30 ft-lbs / 40 Nm   |
| -8            | 40 ft-lbs / 55 Nm   |
| -10           | 60 ft-lbs / 80 Nm   |
| -12           | 85 ft-lbs / 115 Nm  |
| -16           | 110 ft-lbs / 150 Nm |
| -20           | 140 ft-lbs / 190 Nm |
| -24           | 180 ft-lbs / 245 Nm |

REV A

SPECIFICATIONS

| SAE FASTENER TORQUE CHART                                                          |        |                                                                                           |       |        |       |                                                                                             |       |        |       |                                      |      |
|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------|-------|--------|-------|---------------------------------------------------------------------------------------------|-------|--------|-------|--------------------------------------|------|
| • This chart is to be used as a guide only unless noted elsewhere in this manual • |        |                                                                                           |       |        |       |                                                                                             |       |        |       |                                      |      |
| SIZE                                                                               | THREAD | Grade 5  |       |        |       | Grade 8  |       |        |       | A574 High Strength Black Oxide Bolts |      |
|                                                                                    |        | LUBED                                                                                     |       | DRY    |       | LUBED                                                                                       |       | DRY    |       | LUBED                                |      |
|                                                                                    |        | in-lbs                                                                                    | Nm    | in-lbs | Nm    | in-lbs                                                                                      | Nm    | in-lbs | Nm    | in-lbs                               | Nm   |
| 1/4                                                                                | 20     | 100                                                                                       | 11.3  | 80     | 9     | 140                                                                                         | 15.8  | 110    | 12.4  | 130                                  | 14.7 |
|                                                                                    | 28     | 90                                                                                        | 10.1  | 120    | 13.5  | 120                                                                                         | 13.5  | 160    | 18    | 140                                  | 15.8 |
|                                                                                    |        | LUBED                                                                                     |       | DRY    |       | LUBED                                                                                       |       | DRY    |       | LUBED                                |      |
|                                                                                    |        | ft-lbs                                                                                    | Nm    | ft-lbs | Nm    | ft-lbs                                                                                      | Nm    | ft-lbs | Nm    | ft-lbs                               | Nm   |
|                                                                                    |        |                                                                                           |       |        |       |                                                                                             |       |        |       |                                      |      |
| 5/16                                                                               | 18     | 13                                                                                        | 17.6  | 17     | 23    | 18                                                                                          | 24    | 25     | 33.9  | 21                                   | 28.4 |
|                                                                                    | 24     | 14                                                                                        | 19    | 19     | 25.7  | 20                                                                                          | 27.1  | 27     | 36.6  | 24                                   | 32.5 |
| 3/8                                                                                | 16     | 23                                                                                        | 31.2  | 31     | 42    | 33                                                                                          | 44.7  | 44     | 59.6  | 38                                   | 51.5 |
|                                                                                    | 24     | 26                                                                                        | 35.2  | 35     | 47.4  | 37                                                                                          | 50.1  | 49     | 66.4  | 43                                   | 58.3 |
| 7/16                                                                               | 14     | 37                                                                                        | 50.1  | 49     | 66.4  | 50                                                                                          | 67.8  | 70     | 94.7  | 61                                   | 82.7 |
|                                                                                    | 20     | 41                                                                                        | 55.5  | 55     | 74.5  | 60                                                                                          | 81.3  | 80     | 108.4 | 68                                   | 92.1 |
| 1/2                                                                                | 13     | 57                                                                                        | 77.3  | 75     | 101.6 | 80                                                                                          | 108.4 | 110    | 149   | 93                                   | 126  |
|                                                                                    | 20     | 64                                                                                        | 86.7  | 85     | 115   | 90                                                                                          | 122   | 120    | 162   | 105                                  | 142  |
| 9/16                                                                               | 12     | 80                                                                                        | 108.4 | 110    | 149   | 120                                                                                         | 162   | 150    | 203   | 130                                  | 176  |
|                                                                                    | 18     | 90                                                                                        | 122   | 120    | 162   | 130                                                                                         | 176   | 170    | 230   | 140                                  | 189  |
| 5/8                                                                                | 11     | 110                                                                                       | 149   | 150    | 203   | 160                                                                                         | 217   | 210    | 284   | 180                                  | 244  |
|                                                                                    | 18     | 130                                                                                       | 176   | 170    | 230   | 180                                                                                         | 244   | 240    | 325   | 200                                  | 271  |
| 3/4                                                                                | 10     | 200                                                                                       | 271   | 270    | 366   | 280                                                                                         | 379   | 380    | 515   | 320                                  | 433  |
|                                                                                    | 16     | 220                                                                                       | 298   | 300    | 406   | 310                                                                                         | 420   | 420    | 569   | 350                                  | 474  |
| 7/8                                                                                | 9      | 320                                                                                       | 433   | 430    | 583   | 450                                                                                         | 610   | 610    | 827   | 510                                  | 691  |
|                                                                                    | 14     | 350                                                                                       | 474   | 470    | 637   | 500                                                                                         | 678   | 670    | 908   | 560                                  | 759  |
| 1                                                                                  | 8      | 480                                                                                       | 650   | 640    | 867   | 680                                                                                         | 922   | 910    | 1233  | 770                                  | 1044 |
|                                                                                    | 12     | 530                                                                                       | 718   | 710    | 962   | 750                                                                                         | 1016  | 990    | 1342  | 840                                  | 1139 |
| 1 1/8                                                                              | 7      | 590                                                                                       | 800   | 790    | 1071  | 970                                                                                         | 1315  | 1290   | 1749  | 1090                                 | 1477 |
|                                                                                    | 12     | 670                                                                                       | 908   | 890    | 1206  | 1080                                                                                        | 1464  | 1440   | 1952  | 1220                                 | 1654 |
| 1 1/4                                                                              | 7      | 840                                                                                       | 1138  | 1120   | 1518  | 1360                                                                                        | 1844  | 1820   | 2467  | 1530                                 | 2074 |
|                                                                                    | 12     | 930                                                                                       | 1260  | 1240   | 1681  | 1510                                                                                        | 2047  | 2010   | 2725  | 1700                                 | 2304 |
| 1 1/2                                                                              | 6      | 1460                                                                                      | 1979  | 1950   | 2643  | 2370                                                                                        | 3213  | 3160   | 4284  | 2670                                 | 3620 |
|                                                                                    | 12     | 1640                                                                                      | 2223  | 2190   | 2969  | 2670                                                                                        | 3620  | 3560   | 4826  | 3000                                 | 4067 |

| METRIC FASTENER TORQUE CHART                                                       |                                                                                               |      |        |      |                                                                                               |      |        |      |                                                                                                  |      |        |      |                                                                                                  |      |        |      |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------|--------|------|-----------------------------------------------------------------------------------------------|------|--------|------|--------------------------------------------------------------------------------------------------|------|--------|------|--------------------------------------------------------------------------------------------------|------|--------|------|
| • This chart is to be used as a guide only unless noted elsewhere in this manual • |                                                                                               |      |        |      |                                                                                               |      |        |      |                                                                                                  |      |        |      |                                                                                                  |      |        |      |
| Size<br>(mm)                                                                       | Class 4.6  |      |        |      | Class 8.8  |      |        |      | Class 10.9  |      |        |      | Class 12.9  |      |        |      |
|                                                                                    | LUBED                                                                                         |      | DRY    |      | LUBED                                                                                         |      | DRY    |      | LUBED                                                                                            |      | DRY    |      | LUBED                                                                                            |      | DRY    |      |
|                                                                                    | in-lbs                                                                                        | Nm   | in-lbs | Nm   | in-lbs                                                                                        | Nm   | in-lbs | Nm   | in-lbs                                                                                           | Nm   | in-lbs | Nm   | in-lbs                                                                                           | Nm   | in-lbs | Nm   |
| 5                                                                                  | 16                                                                                            | 1.8  | 21     | 2.4  | 41                                                                                            | 4.63 | 54     | 6.18 | 58                                                                                               | 6.63 | 78     | 8.84 | 68                                                                                               | 7.75 | 91     | 10.3 |
| 6                                                                                  | 19                                                                                            | 3.05 | 36     | 4.07 | 69                                                                                            | 7.87 | 93     | 10.5 | 100                                                                                              | 11.3 | 132    | 15   | 116                                                                                              | 13.2 | 155    | 17.6 |
| 7                                                                                  | 45                                                                                            | 5.12 | 60     | 6.83 | 116                                                                                           | 13.2 | 155    | 17.6 | 167                                                                                              | 18.9 | 223    | 25.2 | 195                                                                                              | 22.1 | 260    | 29.4 |
|                                                                                    | LUBED                                                                                         |      | DRY    |      | LUBED                                                                                         |      | DRY    |      | LUBED                                                                                            |      | DRY    |      | LUBED                                                                                            |      | DRY    |      |
|                                                                                    | ft-lbs                                                                                        | Nm   | ft-lbs | Nm   | ft-lbs                                                                                        | Nm   | ft-lbs | Nm   | ft-lbs                                                                                           | Nm   | ft-lbs | Nm   | ft-lbs                                                                                           | Nm   | ft-lbs | Nm   |
| 8                                                                                  | 5.4                                                                                           | 7.41 | 7.2    | 9.88 | 14                                                                                            | 19.1 | 18.8   | 25.5 | 20.1                                                                                             | 27.3 | 26.9   | 36.5 | 23.6                                                                                             | 32   | 31.4   | 42.6 |
| 10                                                                                 | 10.8                                                                                          | 14.7 | 14.4   | 19.6 | 27.9                                                                                          | 37.8 | 37.2   | 50.5 | 39.9                                                                                             | 54.1 | 53.2   | 72.2 | 46.7                                                                                             | 63.3 | 62.3   | 84.4 |
| 12                                                                                 | 18.9                                                                                          | 25.6 | 25.1   | 34.1 | 48.6                                                                                          | 66   | 64.9   | 88   | 69.7                                                                                             | 94.5 | 92.2   | 125  | 81                                                                                               | 110  | 108    | 147  |
| 14                                                                                 | 30.1                                                                                          | 40.8 | 40     | 54.3 | 77.4                                                                                          | 105  | 103    | 140  | 110                                                                                              | 150  | 147    | 200  | 129                                                                                              | 175  | 172    | 234  |
| 16                                                                                 | 46.9                                                                                          | 63.6 | 62.5   | 84.8 | 125                                                                                           | 170  | 166    | 226  | 173                                                                                              | 235  | 230    | 313  | 202                                                                                              | 274  | 269    | 365  |
| 18                                                                                 | 64.5                                                                                          | 87.5 | 86.2   | 117  | 171                                                                                           | 233  | 229    | 311  | 238                                                                                              | 323  | 317    | 430  | 278                                                                                              | 377  | 371    | 503  |
| 20                                                                                 | 91                                                                                            | 124  | 121    | 165  | 243                                                                                           | 330  | 325    | 441  | 337                                                                                              | 458  | 450    | 610  | 394                                                                                              | 535  | 525    | 713  |
| 22                                                                                 | 124                                                                                           | 169  | 166    | 225  | 331                                                                                           | 450  | 442    | 600  | 458                                                                                              | 622  | 612    | 830  | 536                                                                                              | 727  | 715    | 970  |
| 24                                                                                 | 157                                                                                           | 214  | 210    | 285  | 420                                                                                           | 570  | 562    | 762  | 583                                                                                              | 791  | 778    | 1055 | 682                                                                                              | 925  | 909    | 1233 |



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# Scheduled Maintenance Procedures



## Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly, six months, annually and every 2 years as specified on the *Maintenance Inspection Report*.

**⚠ WARNING** Failure to properly complete each inspection when required could result in death, serious injury or substantial machine damage.

- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating machine.
- ☑ Keep records on all inspections for three years.
- ☑ Unless otherwise specified, perform each procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Turntable rotated with the boom between the non-steer wheels
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power supply disconnected from the machine

## About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety warnings and step-by-step instructions.

### Symbols Legend



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

#### ⚠ DANGER

Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

#### ⚠ WARNING

Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

#### ⚠ CAUTION

With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

#### CAUTION

Without safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

#### NOTICE

Used to indicate operation or maintenance information.

- ⦿ Indicates that a specific result is expected after performing a series of steps.
- ✗ Indicates that an incorrect result has occurred after performing a series of steps.

## SCHEDULED MAINTENANCE PROCEDURES

## Maintenance Symbols Legend

**NOTICE**

The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appear at the beginning of a maintenance procedure, it conveys the meaning below.



Indicates that tools will be required to perform this procedure.



Indicates that new parts will be required to perform this procedure.



Indicates that a cold motor or pump will be required to perform this procedure.



Indicates that dealer service will be required to perform this procedure.

## Maintenance Schedule

There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, six months, annual, and two year. The *Scheduled Maintenance Procedures Section* and the *Maintenance Inspection Report* have been divided into five subsections—A, B, C, D and E. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

| Inspection                    | Checklist         |
|-------------------------------|-------------------|
| Daily or every 8 hours        | A                 |
| Quarterly or every 250 hours  | A + B             |
| Six months or every 500 hours | A + B + C         |
| Annual or every 1000 hours    | A + B + C + D     |
| Two year or every 2000 hours  | A + B + C + D + E |

## Maintenance Inspection Report

The maintenance inspection report contains checklists for each type of scheduled inspection.

Make copies of the *Maintenance Inspection Report* to use for each inspection. Store completed forms for three years.

# Pre-Delivery Preparation

## Fundamentals

It is the responsibility of the dealer to perform the Pre-delivery Preparation.

The Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used. If damage or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specifications.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.



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Rev A

## Instructions

Use the operator's manual on your machine.

The Pre-delivery Preparation consists of completing the Pre-operation Inspection, the Maintenance items and the Function Tests.

Use this form to record the results. Place a check in the appropriate box after each part is completed. Follow the instructions in the operator's manual.

If any inspection receives an N, remove the machine from service, repair and re-inspect it. After repair, place a check in the R box.

### Legend

Y = yes, completed

N = no, unable to complete

R = repaired

### Comments

| Pre-Delivery Preparation           | Y | N | R |
|------------------------------------|---|---|---|
| Pre-operation inspection completed |   |   |   |
| Maintenance items completed        |   |   |   |
| Function tests completed           |   |   |   |

Model

Serial number

Date

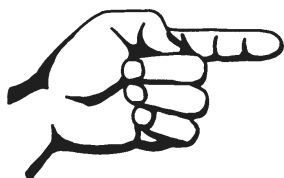
Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company



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# Maintenance Inspection Report

|                             |
|-----------------------------|
| <b>Model</b>                |
| <b>Serial number</b>        |
| <b>Date</b>                 |
| <b>Hour meter</b>           |
| <b>Machine owner</b>        |
| <b>Inspected by (print)</b> |
| <b>Inspector signature</b>  |
| <b>Inspector title</b>      |
| <b>Inspector company</b>    |

## Instructions

- Make copies of this page to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

|                          |                                          |                  |
|--------------------------|------------------------------------------|------------------|
| <input type="checkbox"/> | <b>Daily or 8 hour Inspection:</b>       | <b>A</b>         |
| <input type="checkbox"/> | <b>Quarterly or 250 hour Inspection:</b> | <b>A+B</b>       |
| <input type="checkbox"/> | <b>Six Month or 500 hour Inspection:</b> | <b>A+B+C</b>     |
| <input type="checkbox"/> | <b>Annual or 1000 hours Inspection:</b>  | <b>A+B+C+D</b>   |
| <input type="checkbox"/> | <b>2 Year or 2000 hour Inspection:</b>   | <b>A+B+C+D+E</b> |

- Place a check in the appropriate box after each inspection procedure is completed.
- If any inspection receives an "N", tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the "R" box.

## Legend

Y = yes, acceptable  
 N = no, remove from service  
 R = repaired

## Comments

| Checklist A - Rev B |                          | Y | N | R |
|---------------------|--------------------------|---|---|---|
| A-1                 | Pre-operation inspection |   |   |   |
| A-2                 | Function tests           |   |   |   |

## Perform after 40 hours:

|     |                |  |  |  |
|-----|----------------|--|--|--|
| A-3 | 30 Day Service |  |  |  |
|-----|----------------|--|--|--|

## Perform every 100 hours:

|     |                         |  |  |  |
|-----|-------------------------|--|--|--|
| A-4 | Grease rotation bearing |  |  |  |
|-----|-------------------------|--|--|--|

| Checklist B - Rev C |                             | Y | N | R |
|---------------------|-----------------------------|---|---|---|
| B-1                 | Batteries                   |   |   |   |
| B-2                 | Electrical wiring           |   |   |   |
| B-3                 | Key switch                  |   |   |   |
| B-4                 | Tires and Wheels            |   |   |   |
| B-5                 | Brake configuration         |   |   |   |
| B-6                 | Drive hub oil level         |   |   |   |
| B-7                 | Ground control override     |   |   |   |
| B-8                 | Platform leveling           |   |   |   |
| B-9                 | Drive brakes                |   |   |   |
| B-10                | Drive speed-stowed          |   |   |   |
| B-11                | Drive speed-raised          |   |   |   |
| B-12                | Alarm package (if equipped) |   |   |   |
| B-13                | Turntable rotation stop     |   |   |   |
| B-14                | Electrical contactors       |   |   |   |
| B-15                | Hydraulic oil analysis      |   |   |   |

| Checklist C - Rev B |                                        | Y | N | R |
|---------------------|----------------------------------------|---|---|---|
| C-1                 | Grease platform overload (if equipped) |   |   |   |
| C-2                 | Test platform overload (if equipped)   |   |   |   |

| Checklist D - Rev B |                                                  | Y | N | R |
|---------------------|--------------------------------------------------|---|---|---|
| D-1                 | Boom wear pads                                   |   |   |   |
| D-2                 | Free-wheel configuration                         |   |   |   |
| D-3                 | Turntable bearing bolts                          |   |   |   |
| D-4                 | Drive hub oil                                    |   |   |   |
| D-5                 | Hydraulic return filter                          |   |   |   |
| D-6                 | Calibrate platform overload system (if equipped) |   |   |   |

| Checklist E - Rev B |                | Y | N | R |
|---------------------|----------------|---|---|---|
| E-1                 | Hydraulic oil  |   |   |   |
| E-2                 | Wheel bearings |   |   |   |

---

# Checklist A Procedures

REV B

## A-1

### Perform Pre-operation Inspection

Completing a pre-operation inspection is essential to safe machine operation. The pre-operation inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The pre-operation inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the *Genie Z-30/20N Operator's Manual* on your machine.

## A-2

### Perform Function Tests

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the *Genie Z-30/20N Operator's Manual*. Refer to the Operator's Manual on your machine.

REV B

CHECKLIST A PROCEDURES

### A-3 Perform 30 Day Service



The 30 day maintenance procedure is a one-time sequence of procedures to be performed after the first 30 days or 50 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

1 Perform the following maintenance procedures:

- A-4 Grease the Turntable Rotation Bearing and Worm Drive Gear
- B-4 Check the Lug Nut Torque (including the tires and wheels)
- D-3 Check the Turntable Rotation Bearing Bolts
- D-5 Replace the Hydraulic Tank Return Filter Element

### A-4 Grease the Turntable Rotation Bearing and Worm Drive Gear

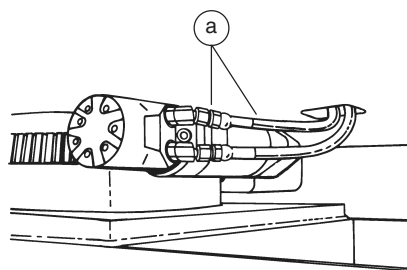


#### NOTICE

Genie specifications require that this procedure be performed every 100 hours.

Frequent application of lubrication to the turntable bearing and worm drive gear is essential to good machine performance and service life. Continued use of an insufficiently greased gear will result in component damage.

- 1 Locate the grease fitting on the tank side turntable cover bulkhead.
- 2 Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches / 10 to 13 cm at a time and repeat this step until the entire bearing has been greased.
- 3 Locate the 2 grease fittings on top of the worm drive housing.



a grease fittings

- 4 Pump grease into the gear until you see it coming out of the side of the gear housing.
- 5 Grease each tooth on the outside of the turntable rotation bearing.

|                    |                     |
|--------------------|---------------------|
| <b>Grease type</b> | Multipurpose grease |
|--------------------|---------------------|

# Checklist B Procedures

REV C

## B-1

### Check the Batteries



Proper battery condition is essential to good machine performance and operational safety. Improper fluid levels or damaged cables and connections can result in engine component damage and hazardous conditions.

**⚠ WARNING** Bodily injury hazard. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

**⚠ WARNING** Electrocutation hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**NOTICE** Perform this test after fully charging the batteries.

**NOTICE** For a more accurate determination of the battery condition, fully charge the battery(s) and allow the battery(s) to rest 24 hours before performing this procedure to allow the battery cells to equalize.

- 1 Put on protective clothing and eye wear.
- 2 Disconnect the battery pack from the machine.
- 3 Open the latch on the battery packs. Swing open the battery packs.
- 4 Remove the battery box cover retaining fasteners. Remove the battery box cover.
- 5 Be sure that the battery cable connections are free of corrosion.
- 6 Be sure that the battery retainer and cable connections are tight.
- 7 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer.
- ⑤ Result: If any battery cell displays a specific gravity of less than 1.026, the battery must be replaced.
- 8 Check the battery acid level of the battery. If needed, replenish with distilled water to the bottom of the battery fill tube. Do not overfill.
- 9 Install the battery vent caps.
- 10 Check each battery pack and verify that the batteries are wired correctly. Refer to the *Battery Connection Diagram* decal on the machine.
- 11 Install the battery box cover and tighten the retaining fasteners.
- 12 Close and latch the battery packs.
- 13 Connect the battery packs to the machine.

REV C

CHECKLIST B PROCEDURES

**B-2****Inspect the Electrical Wiring**

Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

- 1 Remove the drive chassis cover from the non-steer end of the machine.
- 2 Inspect the following areas for burnt, chafed, corroded and loose wires:
  - Electrical power panel
  - Electrical relay panel
  - Ground control panel
  - Function manifold wiring

**⚠ WARNING** Electrocutation hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 3 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 4 Raise the secondary boom until the lower mid-pivot is 10 feet / 3 m off the ground.

- 5 Inspect the turntable center area for burnt, chafed and pinched cables.
- 6 Lower the boom to the stowed position and turn the machine off.
- 7 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
  - Cable track on the primary boom
  - Primary boom to platform cable harness
  - Inside of the platform control box

## CHECKLIST B PROCEDURES

REV C

**B-3****Test the Key Switch**

Proper key switch action and response is essential to safe machine operation. The machine can be operated from the ground or platform controls and the activation of one or the other is accomplished with the key switch. Failure of the key switch to activate the appropriate control panel could cause a hazardous operating situation.

- 1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Turn the key switch to **platform controls**.
- 3 Check the machine functions from the **ground controls**.
- ⊙ Result: The machine functions should **not** operate.
- 4 Turn the key switch to **ground controls**.
- 5 Check the machine functions from the **platform controls**.
- ⊙ Result: The machine functions should **not** operate.
- 6 Turn the key switch to the off position.
- ⊙ Result: No function should operate.

**B-4****Check the Tires and Wheels  
(including lug nut torque)**

Maintaining the tires and wheels, including proper wheel fastener torque, is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

- 1 Check the tire surface and sidewalls for cuts, cracks and unusual wear.
- 2 Check each wheel for damage, bends and cracks.
- 3 Check each lug nut for proper torque. Refer to Section 2, *Specifications*.
- 4 Check the torque of the drive hub mounting bolts. Refer to Section 2, *Specifications*.

REV C

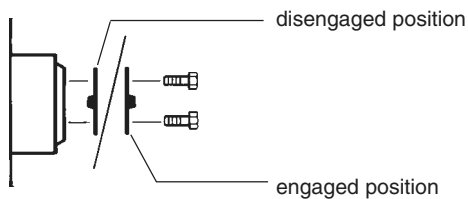
CHECKLIST B PROCEDURES

## B-5 Confirm the Proper Brake Configuration



Proper brake configuration is essential to safe operation and good machine performance. Hydraulically-released, spring-applied individual wheel brakes can appear to operate normally when they are actually not fully operational.

- 1 Check each drive hub disconnect cap to be sure it is in the engaged position.

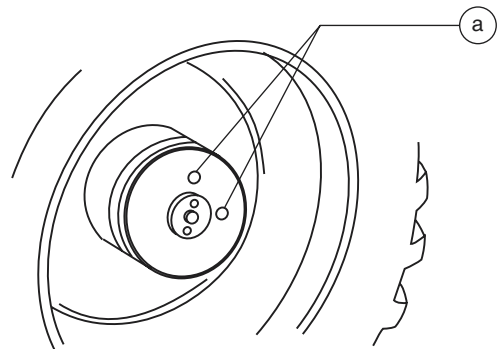


## B-6 Check the Oil Level in the Drive Hubs



Failure to maintain proper drive hub oil levels may cause the machine to perform poorly and continued use may cause component damage.

- 1 Drive the machine to rotate the hub until one of the plugs is located on top and the other is at 90 degrees.



a drive hub plugs

- 2 Remove the plug located at 90 degrees and check the oil level.
- ⦿ Result: The oil level should be even with the bottom of the side plug hole.
- 3 If necessary, remove the top plug and add oil until the oil level is even with the bottom of the side plug hole. Refer to Section 2, *Specifications*.
- 4 Install the plugs into the drive hub.
- 5 Repeat this procedure for each drive hub.

## CHECKLIST B PROCEDURES

REV C

**B-7****Test the Ground Control Override**

A properly functioning ground control override is essential to safe machine operation. The ground control override function is intended to allow ground personnel to operate the machine from the ground controls whether the red Emergency Stop button on the platform controls is in the on or off position. This function is particularly useful if the operator at the platform controls cannot return the boom to the stowed position.

- 1 Push in the red Emergency Stop button at the platform controls to the off position.
  - 2 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position.
  - 3 Operate each boom function through a partial cycle at the ground controls.
- ⦿ Result: All boom functions should operate.

**B-8****Test the Platform Self-leveling**

Automatic platform self-leveling throughout the full cycle of boom raising and lowering is essential for safe machine operation. The platform is maintained level by the platform leveling slave cylinder which is controlled by the platform leveling master cylinder located at the base of the primary boom. A platform self-leveling failure creates an unsafe working condition for platform and ground personnel.

- 1 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
  - 2 Lower the boom to the stowed position.
  - 3 Adjust the platform to a level position using the platform leveling toggle switch.
  - 4 Raise and lower the primary boom through a full cycle.
- ⦿ Result: The platform should remain level at all times to within  $\pm 5$  degrees.

REV C

CHECKLIST B PROCEDURES

**B-9****Test the Drive Brakes**

Proper brake action is essential to safe machine operation. The drive brake function should operate smoothly, free of hesitation, jerking and unusual noise. Hydraulically-released individual wheel brakes can appear to operate normally when they are actually not fully operational.

**AWARNING** Collision hazard. Be sure that the machine is not in free-wheel or partial free-wheel configuration. Refer to B-5, *Confirm the Proper Brake Configuration*.

**NOTICE** Select a test area that is firm, level and free of obstructions.

- 1 Mark a test line on the ground for reference.
- 2 Lower the boom to the stowed position.
- 3 Turn the key switch to platform controls.
- 4 Choose a reference point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the test line.
- 5 Bring the machine to top drive speed before reaching the test line. Release the drive joystick when your reference point on the machine crosses the test line.
- 6 Measure the distance between the test line and your machine reference point. Refer to Section 2, *Specifications*.

**NOTICE** The brakes must be able to hold the machine on any slope it is able to climb.

**B-10****Test the Drive Speed - Stowed Position**

Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

**NOTICE** Select a test area that is firm, level and free of obstructions.

- 1 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.
- 2 Turn the key switch to platform control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 3 Choose a reference point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.
- 4 Bring the machine to maximum drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 5 Continue at full speed and note the time when your machine reference point passes over the finish line. Refer to Section 2, *Specifications*.

## CHECKLIST B PROCEDURES

REV C

## B-11 Test the Drive Speed - Raised or Extended Position



Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

**NOTICE** Select a test area that is firm, level and free of obstructions.

- 1 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.
- 2 Turn the key switch to platform control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 3 Raise the primary boom more than 5 feet / 1.5 m.
- 4 Choose a reference point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.
- 5 Bring the machine to maximum drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 6 Continue at full speed and note the time when your machine reference point passes over the finish line. Refer to Section 2, *Specifications*.

## B-12 Test the Alarm Package (if equipped)

The alarm package includes:

- Travel alarm
- Descent alarm
- Flashing beacon

Alarms and a beacon are installed to alert operators and ground personnel of machine proximity and motion. The alarm package is installed on the ground controls side turntable cover.

- 1 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both ground and platform controls.
- ⦿ Result: The flashing beacon should be on and flashing.
- 2 Hold the function enable toggle switch to either side, then move the primary boom toggle switch to the down position, hold for a moment then release it.
- 3 Hold the function enable toggle switch to either side, then move the secondary boom toggle switch to the down position, hold for a moment then release it.
- 4 Hold the function enable toggle switch to either side, then move the jib boom toggle switch to the down position, hold for a moment then release it.
- ⦿ Result: The descent alarm should sound when each control toggle switch is held down.

REV C

CHECKLIST B PROCEDURES

- 5 Turn the key switch to platform controls.
- ⦿ Result: The flashing beacon should be on and flashing.
- 6 Press down the foot switch.
- 7 Move the primary boom toggle switch to the down position, hold for a moment then release it.
- 8 Move the secondary boom toggle switch to the down position, hold for a moment then release it.
- 9 Move the jib boom toggle switch to the down position, hold for a moment then release it.
- ⦿ Result: The descent alarm should sound when each control toggle switch is held down.
- 10 Move the drive joystick off center, hold for a moment then release it. Move the drive joystick off center in the opposite direction, hold for a moment then release it.
- ⦿ Result: The travel alarm should sound when the drive joystick is moved off center in either direction.

## B-13

### Test the Turntable Rotation Stop

The turntable is capable of rotating the boom 359 degrees and is stopped midpoint between the steer wheels by the rotation stop. Detecting a rotation stop malfunction is essential to safe operation and good machine performance. If the turntable rotates past the rotation stop, component damage may result.

- 1 Turn the key switch to platform controls and pull out the red Emergency Stop buttons to the on position at both ground and platform controls.
- 2 Rotate the turntable to the left as far as it will go.
- ⦿ Result: Movement should stop when the primary boom reaches midpoint between the steer tires.
- 3 Rotate the turntable to the right as far as it will go.
- ⦿ Result: Movement should stop when the primary boom reaches mid-point between the steer tires.

## CHECKLIST B PROCEDURES

REV C

## B-14 Check the Electrical Contactors



Maintaining the electrical contactors in good condition is essential to safe machine operation. Failure to locate a worn or damaged contactor could result in an unsafe working condition and component damage.

- 1 Remove the drive chassis cover from the non-steer end of the machine and locate the electrical contactors mounted on the electrical component mounting panel.
- 2 Visually inspect the contact points of each contactor for the following items:
  - Excessive burns
  - Excessive pitting

**WARNING** Electrocuting hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**NOTICE** Replace the contactors if any damage is found.

## B-15 Perform Hydraulic Oil Analysis



Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

**NOTICE** Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.** See E-1, *Test or Replace the Hydraulic Oil*.

# Checklist C Procedures

REV B

## C-1

### Grease the Platform Overload Mechanism (if equipped)

**NOTICE**

Genie specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first. Perform this procedure more often if dusty conditions exist.

Application of lubrication to the platform overload mechanism is essential to safe machine operation. Continued use of an improperly greased platform overload mechanism could result in the system not sensing an overloaded platform condition and will result in component damage.

- 1 Locate the grease fittings on each pivot pin of the platform overload assembly.
- 2 Thoroughly pump grease into each grease fitting using a multi-purpose grease.

## C-2

### Test the Platform Overload System (if equipped)

**NOTICE**

Genie specifications require that this procedure be performed every 500 hours or six months.

Testing the platform overload system regularly is essential to safe machine operation. Continued use of an improperly operating platform overload system could result in the system not sensing an overloaded platform condition. Machine stability could be compromised resulting in the machine tipping over.

**NOTICE**

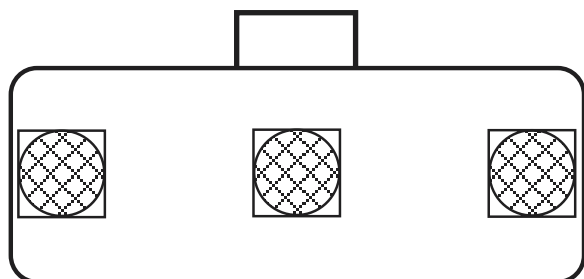
Perform this procedure with the machine on a firm, level surface.

- 1 Turn the key switch to platform control.
- 2 Level the platform from the platform controls.
- 3 Determine the maximum platform capacity. Refer to the machine serial plate.

## CHECKLIST C PROCEDURES

REV B

- 4 Using a suitable lifting device, place an appropriate test weight equal to that of the maximum platform capacity in one of the locations shown.



- ⦿ Result: The platform overload indicator light should be off at both the ground and platform controls.
- 5 Carefully move the test weight to each remaining location.
- ⦿ Result: The platform overload indicator light should be off at both the ground and platform controls.
- 6 Add an additional 10 lbs / 4.5 kg of weight to overload the platform.
- ⦿ Result: The alarm should be sounding. The platform overload indicator light should be flashing at both the ground and platform controls.
- ✗ Result: If the alarm does not sound and the platform overload indicator light does not come on with the test weights in any of the platform locations, the platform overload system needs to be calibrated. See D-6, *Calibrate the Platform Overload System*.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

- 7 Carefully move the test weights to each remaining location in the platform.
- ⦿ Result: The alarm should be sounding. The platform overload indicator light should be flashing at both the ground and platform controls.
  - ✗ Result: If the alarm does not sound and the platform overload indicator light does not come on with the test weights in any of the platform locations, the platform overload system needs to be calibrated. See D-6, *Calibrate the Platform Overload System*.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

- 8 Test all machine functions from the platform controls.
- ⦿ Result: All platform control functions should not operate.
- 9 Turn the key switch to ground control.
- 10 Test all machine functions from the ground controls.
- ⦿ Result: All ground control functions should not operate.

**NOTICE** Machine functions should still operate with auxiliary power at the ground controls.

REV B

## CHECKLIST C PROCEDURES

11 Lift the test weights off the platform floor using a suitable lifting device.

- ⦿ Result: The platform overload indicator light and alarm should turn off at both the ground and platform controls.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light and alarm turn off.

12 Test all machine functions from the ground controls.

- ⦿ Result: All ground control functions should operate normally.

13 Turn the key switch to platform control.

14 Test all machine functions from the platform controls.

- ⦿ Result: All platform control functions should operate.

**NOTICE** If the platform overload system is not operating properly, see D-6, *Calibrate the Platform Overload System*.

# Checklist D Procedures

REV B

## D-1

### Check the Primary Boom Wear Pads



Maintaining the primary boom wear pads in good condition is essential to safe machine operation. Wear pads are placed on boom tube surfaces to provide a low friction, replaceable wear pad between moving parts. Improperly shimmed wear pads or continued use of worn out wear pads may result in component damage and unsafe operating conditions.

- 1 Measure each wear pad. Replace the wear pad once it reaches the minimum allowable thickness. If the wear pad is still within specifications, shim as necessary to obtain minimum clearance with zero binding.
- 2 Extend and retract the primary boom through the entire range of motion to check for tight spots that could cause binding or scraping.

#### NOTICE

Always maintain squareness between the primary boom outer and inner tubes.

#### Models without rotating jib boom:

| Primary boom wear pad specifications           | New                           | Minimum                       |
|------------------------------------------------|-------------------------------|-------------------------------|
| Top and side wear pads (extension end of boom) | $\frac{3}{4}$ inch<br>19 mm   | $\frac{5}{8}$ inch<br>15.9 mm |
| Bottom wear pads (extension end of boom)       | $\frac{3}{4}$ inch<br>19 mm   | $\frac{5}{8}$ inch<br>15.9 mm |
| Bottom and side wear pads (pivot end of boom)  | $\frac{3}{4}$ inch<br>19 mm   | $\frac{5}{8}$ inch<br>15.9 mm |
| Top wear pads (pivot end of boom)              | $\frac{1}{2}$ inch<br>12.7 mm | $\frac{3}{8}$ inch<br>9.5 mm  |

#### Models with rotating jib boom:

| Primary boom wear pad specifications | New                           | Minimum                      |
|--------------------------------------|-------------------------------|------------------------------|
| All wear pads                        | $\frac{1}{2}$ inch<br>12.7 mm | $\frac{3}{8}$ inch<br>9.5 mm |

REV B

CHECKLIST D PROCEDURES

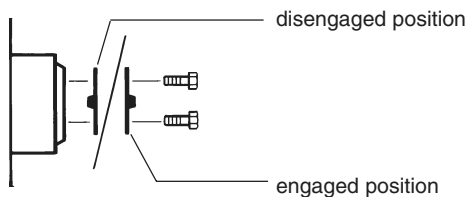
**D-2****Check the Free-wheel Configuration**

Proper use of the free-wheel configuration is essential to safe machine operation. The free-wheel configuration is used primarily for towing. A machine configured to free-wheel without operator knowledge may cause death or serious injury and property damage.

**WARNING** Collision hazard. Select a work site that is firm and level.

**NOTICE** Component damage hazard. If the machine must be towed, do not exceed 2 mph / 3.2 km/h.

- 1 Chock the steer wheels to prevent the machine from rolling.
- 2 Center a lifting jack of ample capacity (15,000 lbs / 7000 kg) under the drive chassis between the non-steer wheels.
- 3 Lift the wheels off the ground and then place blocks under the drive chassis for support.
- 4 Disengage the drive hubs by turning over the drive hub disconnect caps on each non-steer wheel hub.



- 5 Manually rotate each non-steer wheel.
- 6 Result: Each non-steer wheel should rotate with minimum effort.
- 6 Engage the drive hubs by turning over the drive hub disconnect caps.
- 7 Carefully remove the blocks, lower the machine and remove the jack.

**WARNING** Collision hazard. Failure to engage the drive hubs could result in death or serious injury and property damage.

## CHECKLIST D PROCEDURES

REV B

**D-3****Check the Turntable Rotation Bearing Bolts**

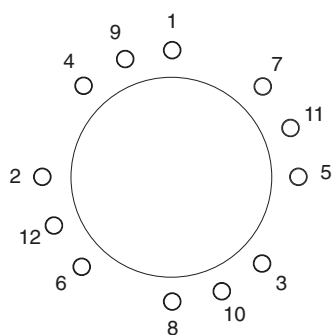
Maintaining proper torque on the turntable bearing bolts is essential to safe machine operation. Improper bolt torque could result in an unsafe operating condition and component damage.

- 1 Raise the secondary boom and place a safety chock on the secondary boom lift cylinder. Carefully lower the secondary boom onto the lift cylinder safety chock.

**AWARNING** Crushing hazard. Keep hands away from the cylinder and all moving parts when lowering the secondary boom.

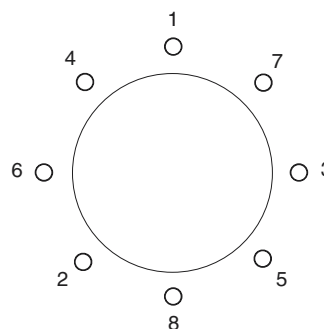
**NOTICE** A lift cylinder safety chock is available through Genie Service Parts (Genie part no. 36555).

- 2 Confirm that each turntable mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence

- 3 Raise the secondary boom and remove the safety chock. Lower the secondary boom to the stowed position.
- 4 Open the latch on the battery packs and swing them out to expose the turntable bearing bolt access hole.
- 5 Confirm that each turntable bearing mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence

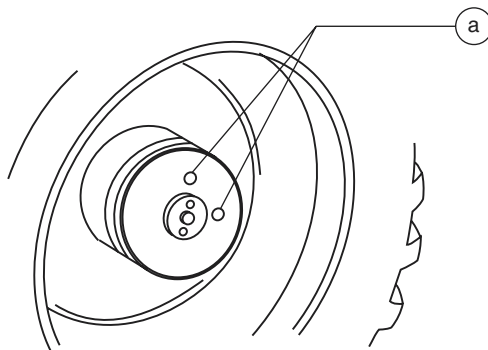
REV B

CHECKLIST D PROCEDURES

**D-4****Replace the Drive Hub Oil**

Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

- 1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.
- 2 Remove both plugs and drain the oil into a suitable container.
- 3 Drive the machine until one plug is at the top and the other is at 90 degrees.



a drive hub plugs

- 4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side plug hole. Refer to Section 2, *Specifications*.
- 5 Install the plugs into the drive hub.
- 6 Repeat this procedure for the other drive hub.

**D-5****Replace the Hydraulic Tank Return Filter Element****NOTICE**

Genie requires that this procedure be performed every 1000 hours or operation or yearly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Replacement of the hydraulic return filter element is essential for good machine performance and service life. A dirty or clogged filter element may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter element be replaced more often.

**CAUTION**

Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

- 1 Locate the hydraulic return filter housing on top of the hydraulic tank.
- 2 Clean the area around the oil filter housing cap located on top of the reservoir.
- 3 Remove the cap from the housing.
- 4 Lift the handle on the filter element and rotate the element counterclockwise to release the element from the housing.
- 5 Remove the filter element from the filter housing.

## CHECKLIST D PROCEDURES

REV B

- 6 Install the new oil filter element into the filter housing.
- 7 Push the filter element down to be sure the o-ring on the element is fully seated into the housing.
- 8 Rotate the filter element clockwise to lock it in place.
- 9 Install the filter housing cap.
- 10 Clean up any oil that may have spilled during the replacement procedure.
- 11 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter housing.
- 12 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position.
- 13 Move and hold the function enable toggle switch to either side and move and hold the primary boom toggle switch in the up direction.
- 14 Inspect the filter housing and related components to be sure that there are no leaks.

**D-6****Calibrate the Platform Overload System (if equipped)****NOTICE**

Genie specifications require that this procedure be performed every 1000 hours of operation or yearly.

Yearly calibration of the platform overload system is essential to safe machine operation. Continued use of an improperly calibrated platform overload system could result in the system failing to sense an overloaded platform. The stability of the machine is compromised and it could tip over.

**NOTICE**

Perform this procedure with the machine on a firm, level surface.

- 1 Level the platform.
- 2 Determine the maximum platform capacity. Refer to the machine serial plate.
- 3 Using a suitable lifting device, place an appropriate test weight equal to that of the maximum platform capacity at the center of the platform floor.

REV B

CHECKLIST D PROCEDURES

**Determine the limit switch trigger point:**

- 4 Gently move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm. Allow the platform to settle.

- ⦿ **Result: The overload indicator light and the alarm are on.** Slowly tighten the load spring adjustment nut by turning it clockwise just until the overload indicator light and alarm turns off.

**NOTICE** The platform will need to be moved up and down and allowed to settle in between adjustments.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

- ⦿ **Result: The overload indicator light and alarm are off.** Slowly loosen the load spring adjustment nut by turning it counterclockwise just until the overload indicator light and alarm turn on. Then slowly tighten the load spring adjustment nut by turning it clockwise just until the overload indicator light and alarm turn off.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

**NOTICE** The platform will need to be moved up and down and allowed to settle in between adjustments.

**Confirm the setting:**

- 5 Turn the key switch to platform control.
- 6 Lift the test weight off the platform floor using a suitable lifting device.
- 7 Place the test weight back onto the center of the platform floor using a suitable lifting device.

- ⦿ **Result: The alarm should be off.** The platform overload indicator light should be off at both the ground and platform controls.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light and alarm turn off.

- 8 Add an additional 10 lb / 4.5 kg test weight to the original test weight to overload the platform.

- ⦿ **Result: The alarm should be sounding.** The platform overload indicator light should be flashing at both the ground and platform controls.

**NOTICE** There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

- 9 Test all machine functions from the platform controls.

- ⦿ **Result: All platform control functions should not operate.**

- 10 Turn the key switch to ground control.

- 11 Test all machine functions from the ground controls.

- ⦿ **Result: All ground control functions should not operate.**

**NOTICE** If the platform overload system is not operating properly, repeat steps 1 through 4.

# Checklist E Procedures

REV B

## E-1

### Test or Replace the Hydraulic Oil



Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the oil be changed more often.

#### NOTICE

Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.**

#### NOTICE

When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

#### NOTICE

Perform this procedure with the boom in the stowed position.

- 1 Close the hydraulic shutoff valve located at the hydraulic tank.

#### CAUTION

Component damage hazard. The machine must not be operated with the hydraulic tank shutoff valve in the closed position or component damage will occur. If the tank valve is closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

- 2 Place a suitable container under the hydraulic tank.
- 3 Tag, disconnect and plug the hydraulic hose from the hydraulic tank shutoff valve.

#### WARNING

Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 4 Open the valve on the hydraulic tank and completely drain the oil into a suitable container.

#### CAUTION

Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

REV B

CHECKLIST E PROCEDURES

- 5 Tag, disconnect and plug the hydraulic hoses from the hydraulic tank return filter housing. Cap the fittings on the filter housing.

**WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

**CAUTION** Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

- 6 Remove the hydraulic tank mounting fasteners. Remove the hydraulic tank from the machine.
- 7 Remove the tank lid retaining fasteners and remove the lid and return filter assembly from the tank.
- 8 Remove the suction strainer from the hydraulic tank and clean it using a mild solvent.
- 9 Rinse out the inside of the tank with a mild solvent.
- 10 Install the suction strainer into the tank.
- 11 Install the lid and return filter assembly onto the hydraulic tank.
- 12 Install the hydraulic tank on the machine. Install the hydraulic tank mounting fasteners and torque them to 8 ft-lbs / 10.8 Nm.
- 13 Install the hydraulic hoses.
- 14 Fill the tank with hydraulic oil until the fluid is within the **FULL** and **ADD** marks on the hydraulic tank. Do not overfill. Refer to Section 2, *Specifications*.
- 15 Clean up any oil that may have spilled. Properly discard of used oil.
- 16 Open the hydraulic tank shutoff valve.

**CAUTION** Component damage hazard. Be sure to open the hydraulic tank shutoff valve after installing the hydraulic tank.

**CAUTION** Component damage hazard. The hydraulic tank is plastic and may become damaged if the tank mounting fasteners are over tightened.

## CHECKLIST E PROCEDURES

REV B

**E-2****Grease the Steer Axle Wheel Bearings**

Maintaining the steer axle wheel bearings is essential for safe machine operation and service life. Operating the machine with loose or worn wheel bearings may cause an unsafe operating condition and continued use may result in component damage. Extremely wet or dirty conditions or regular steam cleaning and pressure washing of the machine may require that this procedure be performed more often.

- 1 Loosen the wheel lug nuts. Do not remove them.
- 2 Block the non-steer wheels, then center a lifting jack under the steer axle.
- 3 Raise the machine 6 inches / 15 cm and place blocks under the drive chassis for support.
- 4 Remove the lug nuts. Remove the tire and wheel assembly.
- 5 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.
- ⦿ Result: There should be no side to side or up and down movement.

**Skip to step 10 if there is no movement.**

- 6 Remove the dust cap from the hub. Remove the cotter pin from the castle nut.
- 7 Tighten the castle nut to 35 ft-lbs / 47 Nm to seat the bearings.
- 8 Loosen the castle nut and re-tighten to 8 ft-lbs / 11 Nm.
- 9 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.
- ⦿ Result: If there is no side to side or up and down movement, continue with step 11 and grease the wheel bearings.
- ✗ Result: If there is side to side or up and down movement, continue to step 11 and replace the wheel bearings with new ones.

**NOTICE**

When replacing a wheel bearing, both the inner and outer bearings, including the pressed-in races, must be replaced.

- 10 Remove the dust cap from the hub. Remove the cotter pin from the castle nut.
- 11 Remove the castle nut.
- 12 Pull the hub off of the spindle. The washer and outer bearing should fall loose from the hub.
- 13 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.
- 14 Pack both bearings with clean, fresh grease.
- 15 Place the large inner bearing into the rear of the hub.

REV B

CHECKLIST E PROCEDURES

16 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.

17 Slide the hub onto the yoke spindle.

**CAUTION** Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

18 Place the outer bearing into the hub.

19 Install the washer and castle nut.

20 Tighten the castle nut to 35 ft-lbs / 47 Nm to seat the bearings.

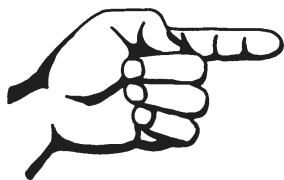
21 Loosen the castle nut and re-tighten to 8 ft-lbs / 11 Nm.

22 Install a new cotter pin. Bend the cotter pin to lock it in.

**NOTICE** Always use a new cotter pin when installing a castle nut.

23 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications*.

24 Raise the machine and remove the blocks. Lower the machine to the ground.



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# Repair Procedures



## Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

## Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the *Genie Z-30/20N Operator's Manual* on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in stowed position
  - Turntable rotated with the boom between the non-steer wheels
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power supply disconnected from the machine

## About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. Then to reassemble, perform the disassembly steps in reverse order.

## Symbols Legend



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### **⚠ DANGER**

Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

### **⚠ WARNING**

Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

### **⚠ CAUTION**

With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

### **CAUTION**

Without safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

### **NOTICE**

Used to indicate operation or maintenance information.

⦿ Indicates that a specific result is expected after performing a series of steps.

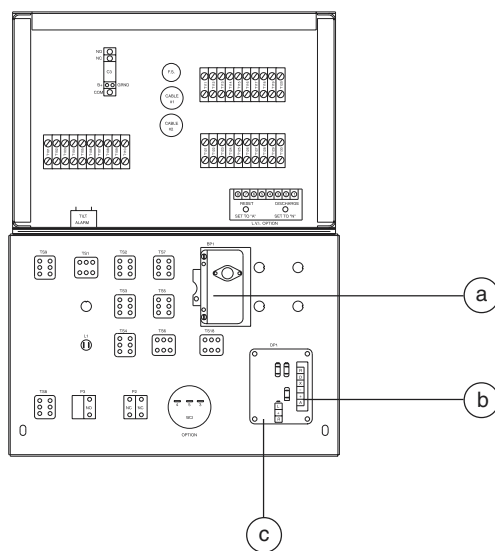
✗ Indicates that an incorrect result has occurred after performing a series of steps.

# Platform Controls

REV B

## 1-1 Controllers

The drive joystick is connected to the drive motor controller, located under the drive chassis cover at the non-steer end of the machine. Maintaining the boom function speed controller at the proper settings is essential to safe machine operation. The boom function speed controller should operate smoothly and provide proportional speed control through its entire range of motion. For further information or assistance, contact the Genie Industries Service Department.



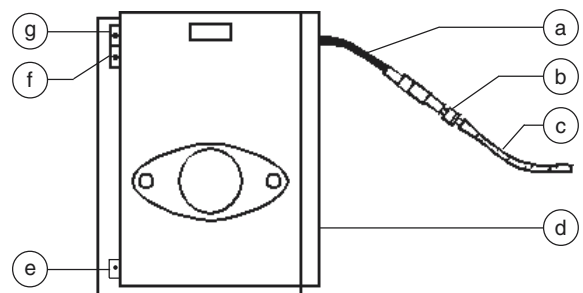
- a boom function speed controller
- b drive and brake printed circuit board
- c drive joystick

## Boom Function Speed Controller Adjustments

**WARNING** Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**NOTICE** Do not adjust the boom function speed controller unless the static battery supply voltage is above 24V DC.

- 1 Turn the key switch to platform controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Open the platform control box lid and locate the boom function speed controller.



- a black/red wire
- b diode
- c white/red wire
- d boom function speed controller
- e ramp rate trimpot
- f threshold trimpot
- g max out trimpot

## REV B

## PLATFORM CONTROLS

- 3 Locate the diode between the black/red wire from the boom function speed controller and the white/red wire. Disconnect the white/red wire from the diode on the black/red wire.
- 4 Connect the negative lead from a multi-meter set to measure amperage to the wire connector of the white/red wire. Connect the positive lead of the multi-meter to the diode on the black/red wire.
- 5 Turn the boom function speed controller to the CREEP position.
- 6 Set the threshold: Press down the foot switch and move the primary boom toggle switch to the up position. Adjust the amperage to 0.28A. Turn the threshold trimpot adjustment screw clockwise to increase the amperage or counterclockwise to decrease the amperage.
- 7 Turn the boom function speed controller to the 9 position.
- 8 Set the max out: Press down the foot switch and move the primary boom toggle switch to the down position. Adjust the amperage to 0.65A. Turn the max out trimpot adjustment screw clockwise to increase the amperage or counterclockwise to decrease the amperage.
- 9 Start a timer and simultaneously press down the foot switch and move the primary boom toggle switch in the down direction. Note how long it takes to reach 0.65A.

- 10 Set the ramp rate: Turn the ramp rate trimpot to obtain a 2 second delay from 0 to 0.65A. Turn the trimpot clockwise to increase the time or counterclockwise to decrease the time.

- 11 Disconnect the leads from the multi-meter and connect the white/red wire to the diode on the black/red wire.

---

**Boom function speed  
controller specifications**


---

|                                           |           |
|-------------------------------------------|-----------|
| Threshold<br>(controller turned to CREEP) | 0.28A     |
| Max out<br>(controller turned to 9)       | 0.65A     |
| Ramp rate                                 | 2 seconds |

---

# Platform Components

REV B

## 2-1

### Platform Leveling Slave Cylinder

The slave cylinder and the rotator pivot are the two primary supports for the platform. The slave cylinder keeps the platform level through the entire range of primary boom motion. It operates in a closed loop hydraulic circuit with the master cylinder. The slave cylinder is equipped with counterbalance valves to prevent platform movement in the event of a hydraulic line failure.

### How to Remove the Slave Cylinder

**NOTICE**

Before cylinder removal is considered, bleed the slave cylinder to be sure there is no air in the closed loop hydraulic circuit.

**NOTICE**

When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Extend the boom until the slave cylinder barrel-end pivot pin is accessible.
- 2 Raise the boom slightly and place blocks under the platform for support. Lower the boom until the platform is resting on the blocks.

- 3 Tag and disconnect the hydraulic hoses to the slave cylinder at the union and connect them together with a connector. Cap the fittings on the cylinder hoses.

**WARNING**

Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 4 Remove the external snap rings from the rod-end pivot pin. Do not remove the pin.
- 5 Remove the external snap rings from the barrel-end pivot pin.
- 6 Place a block of wood under the barrel of the slave cylinder for support.
- 7 Use a soft metal drift to remove the rod-end pivot pin.

**WARNING**

Crushing hazard. The platform could fall if not properly supported.

- 8 Use a soft metal drift to remove the barrel-end pivot pin.
- 9 Carefully pull the cylinder with hydraulic hoses out of the boom.

**WARNING**

Crushing hazard. The slave cylinder could fall if not properly supported.

### How to Bleed the Slave Cylinder

- 1 Raise the jib boom to a horizontal position.
- 2 Move the platform level toggle switch up and down through two platform leveling cycles to remove any air that might be in the system.

REV B

PLATFORM COMPONENTS

## 2-2

### Platform Rotator

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 180 degrees.

#### How to Remove the Platform Rotator

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform.
- 2 Tag, disconnect and plug the hydraulic hoses from the platform rotate manifold.

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Support the platform mounting weldment. Do not apply any lifting pressure.
- 4 Remove the six mounting bolts from the platform mounting weldment. Remove the center bolt and slide the platform mounting weldment off of the platform rotator.

- 5 Support the platform rotator with a suitable lifting device. Do not apply any lifting pressure.
- 6 Remove the pin retaining fasteners from the jib boom and leveling links to platform rotator pivot pins. Do not remove the pins.
- 7 Support the jib boom, jib boom cylinder and leveling links with an overhead crane.
- 8 Use a soft metal drift to drive both pins out, then remove the platform rotator from the machine.

**⚠CAUTION** Crushing hazard. The platform rotator will fall when the pins are removed if not properly supported.

**NOTICE** When installing the platform rotator, be sure to torque the fasteners to specification. Refer to Section 2, *Specifications*.

#### How to Bleed the Platform Rotator

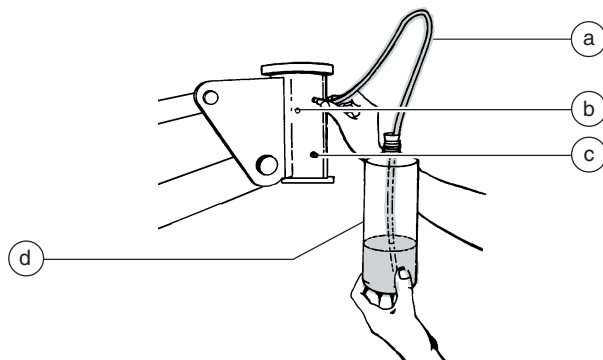
**NOTICE** This procedure will require two people.

- 1 Move the function enable toggle switch to either side and activate the platform rotate toggle switch to the right and then to the left through two platform rotation cycles. Then hold the switch to the right position until the platform is fully rotated to the right.

## PLATFORM COMPONENTS

REV B

- 2 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any drainage. Secure the container to the boom.
- 3 Open the top bleed valve on the rotator, but do not remove it.



- a clear hose
- b top bleed valve
- c bottom bleed valve
- d container

- 4 Move the function enable toggle switch to either side and hold the platform rotate toggle switch to the left position until the platform is fully rotated to the left. Continue holding the toggle switch until air stops coming out of the bleed valve. Close the bleed valve.

**WARNING** Crushing hazard. Keep clear of the platform during rotation.

- 5 Connect the clear hose to the bottom bleed valve and open the valve. Do not remove the bleed valve.
- 6 Move the function enable toggle switch to either side and hold the platform rotate toggle switch to the right position until the platform is fully rotated to the right. Continue holding the toggle switch until air stops coming out of the bleed valve. Close the bleed valve.

**WARNING** Crushing hazard. Keep clear of the platform during rotation.

- 7 Remove the hose from the bleed valve and clean up any hydraulic oil that may have spilled.
- 8 Rotate the platform fully in both directions and inspect the bleed valves for leaks.

REV B

# Jib Boom Components

## 3-1 Jib Boom

### How to Remove the Jib Boom

**NOTICE** Perform this procedure with the boom in the stowed position.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform.
- 2 Remove the platform mounting weldment and the platform rotator. See 2-2, *How to Remove the Platform Rotator*.
- 3 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the jib boom lift cylinder.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 4 Remove the cable cover from the side of the jib boom.

- 5 Remove the mounting fasteners from the jib boom/platform rotate manifold and lay the manifold to the side. Do not remove the hoses or disconnect the wiring.

**CAUTION** Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

- 6 **Models with rotating jib boom:** Tag, disconnect and plug the hydraulic hoses from the jib boom rotator. Cap the fittings on the rotator manifold.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 7 Attach a lifting strap from an overhead crane to the jib boom.
- 8 **Models without rotating jib boom:** Remove the pin retaining fastener from the jib boom pivot pin at the jib boom bellcrank. Use a soft metal drift to remove the pin, then remove the jib boom from the jib boom bellcrank.

**⚠ WARNING** Crushing hazard. The jib boom could fall when the pin is removed if not properly supported by the overhead crane.

**Models with rotating jib boom:** Remove the pin retaining fastener from the jib boom pivot pin at the jib boom rotator. Use a soft metal drift to remove the pin, then remove the jib boom from the jib boom rotator.

**⚠ WARNING** Crushing hazard. The jib boom could fall when the pin is removed if not properly supported by the overhead crane.

## JIB BOOM COMPONENTS

REV B

- 9 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

- 10 **Models without rotating jib boom:** Remove both of the jib boom leveling links from the bell crank.

**Models with rotating jib boom:** Remove both of the jib boom leveling links from the jib boom rotator.

- 11 Attach a lifting strap from an overhead crane to the rod-end of the jib boom lift cylinder.

- 12 **Models without rotating jib boom:** Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the bell crank.

**Models with rotating jib boom:** Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the jib boom rotator.

**⚠ WARNING** Crushing hazard. The jib boom lift cylinder could fall when the pin is removed if not properly supported by the overhead crane.

### 3-2

## Jib Boom Bell Crank (models without rotating jib boom)

### How to Remove the Jib Boom Bell Crank

**NOTICE** Perform this procedure with the boom in the stowed position.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the Jib Boom, See 3-1, *How to Remove the Jib Boom*.
- 2 Support and secure the jib boom bell crank to an appropriate lifting device.
- 3 Remove the pin retaining fasteners from the slave cylinder rod-end pivot pin. Do not remove the pin.
- 4 Place a block of wood under the platform leveling slave cylinder for support. Protect the cylinder rod from damage.
- 5 Remove the pin retaining fasteners from the jib boom bell crank at the extension boom. Use a soft metal drift to remove the pin.
- 6 Use a soft metal drift to remove the slave cylinder rod-end pivot pin.
- 7 Remove the jib boom bell crank from the extension boom.

**⚠ WARNING** Crushing hazard. The jib boom bell crank could become unbalanced and fall when the pins are removed if not properly supported and secured to the lifting device.

REV B

JIB BOOM COMPONENTS

### 3-3

## Jib Boom Rotator (models with rotating jib boom)

The platform rotator is a hydraulically activated helical gear assembly used to rotate the jib boom 160 degrees.

### How to Remove the Jib Boom Rotator

**NOTICE** Perform this procedure with the boom in the stowed position.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the jib boom, See 3-1, *How to Remove the Jib Boom*.
- 2 Support and secure the jib boom rotator to an appropriate lifting device.
- 3 Remove the eight mounting bolts from the jib boom rotator mount.
- 4 Remove the center bolt. Carefully remove the jib boom rotator from the machine.

**WARNING** Crushing hazard. The jib boom rotator could become unbalanced and fall when removed from the machine if not properly supported and secured to the lifting device.

**NOTICE** When installing the jib boom rotator, be sure to torque the fasteners to specification. Refer to Section 2, *Specifications*.

- 5 Support and secure the jib boom bell crank to an appropriate lifting device.
- 6 Remove the pin retaining fasteners from the slave cylinder rod-end pivot pin. Do not remove the pin.
- 7 Place a block of wood under the platform leveling slave cylinder for support. Protect the cylinder rod from damage.
- 8 Remove the pin retaining fasteners from the jib boom bell crank at the extension boom. Use a soft metal drift to remove the pin.
- 9 Use a soft metal drift to remove the slave cylinder rod-end pivot pin.
- 10 Remove the jib boom bell crank from the extension boom.

**WARNING** Crushing hazard. The jib boom bell crank could become unbalanced and fall when the pins are removed if not properly supported and secured to the lifting device.

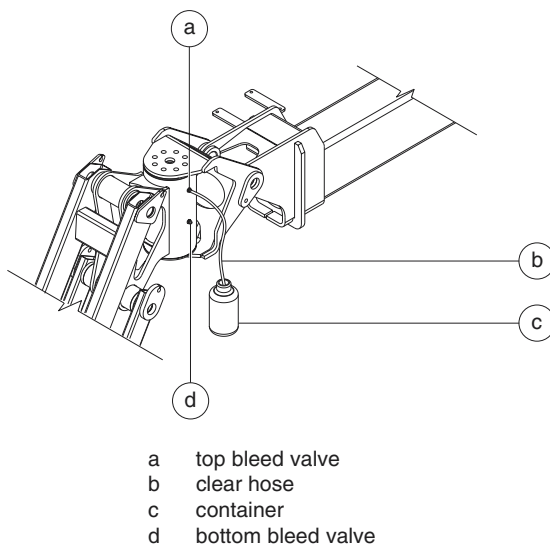
## JIB BOOM COMPONENTS

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## How to Bleed the Jib Boom Rotator

**NOTICE** This procedure will require two people.

- 1 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both the ground and platform controls.
- 2 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any drainage. Open the top bleed valve, but do not remove it.



- 3 Move and hold the function enable toggle switch to either side and move and hold the jib boom rotate toggle switch to the right for approximately 5 seconds, then release it. Repeat three times.

**WARNING** Crushing hazard. Keep hands and head clear of the platform pivot weldment during rotation.

- 4 Move and hold the function enable switch to either side and move and hold the jib boom rotate toggle switch to the left for approximately 5 seconds, then release it. Repeat three times.
- 5 Fully rotate the jib boom to the left and continue holding the jib boom rotate toggle switch until air stops coming out of the bleed valve. Immediately release the platform rotate toggle switch and close the bleed valve.

**WARNING** Crushing hazard. Keep hands and head clear of the platform pivot weldment during rotation.

- 6 Rotate the jib boom to the right until the jib boom is centered.
- 7 Connect the clear hose to the bottom bleed valve and open the valve.
- 8 Rotate the jib boom to the right and continue holding the platform rotate toggle switch until air stops coming out of the bleed valve.

**WARNING** Crushing hazard. Keep hands and head clear of the jib boom during rotation.

- 9 Close the bleed valve and remove the hose.
- 10 Rotate the jib boom full left and right and inspect the bleed valves for leaks.

**WARNING** Crushing hazard. Keep hands and head clear of the platform pivot weldment during rotation.

- 11 Turn the key switch to the off position and clean up any hydraulic oil that may have spilled.

REV B

JIB BOOM COMPONENTS

### 3-4 Jib Boom Lift Cylinder

#### How to Remove the Jib Boom Lift Cylinder

**NOTICE** Perform this procedure with the boom in the stowed position.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the jib boom slightly and place blocks under the platform mounting weldment for support. Lower the jib boom until the platform is resting on the blocks.
- 2 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

**WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

- 4 Use a soft metal drift to tap the rod-end pivot pin half way out and lower one of the leveling links to the ground. Tap the pin the other direction and lower the opposite leveling link. Do not remove the pin.
- 5 Attach a lifting strap from an overhead crane to the rod end of the jib boom lift cylinder.
- 6 Remove the pin retaining fasteners from the jib boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the barrel-end pivot pin.
- 7 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the machine.

**WARNING** Crushing hazard. The jib boom lift cylinder could fall when the pins are removed if not properly supported by the overhead crane.

# Primary Boom Components

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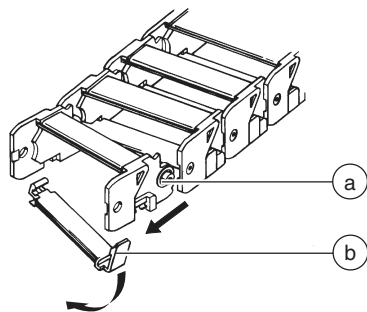
## 4-1 Cable Track

The primary boom cable track guides the cables and hoses running up the boom. It can be repaired link by link without removing the cables and hoses that run through it. Removing the entire primary boom cable track is only necessary when performing major repairs that involve removing the primary boom.

### How to Repair the Plastic Cable Track

**CAUTION** Component damage hazard. The primary boom cable track can be damaged if it is twisted.

**NOTICE** A 7-link repair section of cable track is available through the Genie Industries Service Parts (Genie part no. 58919).



a link separation point  
b lower clip

- 1 Use a slotted screwdriver to pry down on the lower clip.
- 2 Repeat step 1 for each link.
- 3 To remove a single link, open the lower clip. Use a screwdriver to pry the link to the side.

## 4-2 Primary Boom

### How to Shim the Primary Boom

- 1 Extend the boom until the wear pads are accessible.
- 2 Loosen the wear pad mounting fasteners.
- 3 Install the new shims under the wear pad to obtain zero clearance and zero drag.
- 4 Tighten the mounting fasteners.
- 5 Extend and retract the boom through an entire cycle. Check for tight spots that could cause scraping or binding.

**NOTICE** Always maintain squareness between the outer and inner boom tubes.

REV B

PRIMARY BOOM COMPONENTS

## How to Remove the Primary Boom

**⚠ WARNING** Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

**NOTICE** Perform this procedure with the boom in the stowed position.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform.
- 2 Remove the platform rotator. See 2-3, *How to Remove the Platform Rotator*.
- 3 Remove the jib boom. See 3-1, *How to Remove the Jib Boom*.
- 4 **Models without rotating jib boom:** Remove the jib boom bellcrank. See 3-2, *How to Remove the Jib Boom Bellcrank*.

**Models with rotating jib boom:** Remove the jib boom rotator. See 3-3, *How to Remove the Jib Boom Rotator*.

- 5 Tag, disconnect and cap the slave cylinder hydraulic hoses at the union. Plug the hoses from the slave cylinder.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 6 Remove the upper cable track mounting fasteners from the platform end of the boom.
- 7 Remove the cable track mounting fasteners, then remove the cable track from the boom and lay it flat on the ground.

**CAUTION** Component damage hazard. The cable track can be damaged if it is twisted.

**CAUTION** Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

- 8 Raise the secondary boom until the primary boom lift cylinder rod-end pivot pin is accessible above the mid-pivot weldment. Turn the machine off.
- 9 Disconnect the battery packs from the machine.
- 10 Remove all the hose and cable clamps from the underside of the primary boom and at the pivot end of the primary boom.

## PRIMARY BOOM COMPONENTS

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11 Attach a lifting strap of ample capacity from an overhead 5 ton / 5000 kg crane to the primary boom for support.

12 Locate the cables from the primary boom cable track to the platform control box. Number each cable and its entry location at the platform control box.

13 Open the platform control box.

14 Tag and disconnect each wire from the cables in the platform control box.

15 Pull all the cables out of the platform control box.

16 Remove the front counterweight cover.

17 Remove the extension boom drive limit switch from the side of the primary boom at the pivot end. Do not disconnect the wiring.

18 Tag, disconnect and plug the hydraulic hoses from the jib boom/platform rotate manifold.

19 Pull all the electrical cables and hydraulic hoses out of the plastic cable track. Then pull all the electrical cables and hydraulic hoses out through the boom rest pad.

**CAUTION** Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

20 Remove the pin retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pivot pin. Pull the cylinder back and secure it from moving.

21 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

**WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

22 Attach a lifting strap from an overhead crane to the primary boom lift cylinder.

23 Place 2 x 4 x 18 inch / 5 x 10 x 46 cm support blocks under the cylinder, across the secondary boom.

24 Remove the pin retaining fastener from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

**WARNING** Crushing hazard. The primary boom lift cylinder could fall when it is removed from the machine if not properly supported.

25 Lower the rod end of the primary boom lift cylinder onto support blocks. Protect the cylinder rod from damage.

26 Remove the pin retaining fastener from the primary boom pivot pin.

27 Remove the primary boom pivot pin with a soft metal drift. Carefully remove the primary boom assembly from the machine.

**WARNING** Crushing hazard. The primary boom assembly could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

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## PRIMARY BOOM COMPONENTS

## How to Disassemble the Primary Boom

**NOTICE**

Complete disassembly of the boom is only necessary if the outer or inner boom tubes must be replaced. The extension cylinder can be removed without completely disassembling the boom. See 4-4, *How to Remove the Extension Cylinder*.

- 1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.
- 2 Place blocks under the extension cylinder for support.
- 3 Remove the retaining fasteners from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.
- 4 Remove and label the location of the wear pads from the top side of the boom tube at the platform end of the boom.

**NOTICE**

Pay careful attention to the location and amount of shims used with each wear pad.

- 5 Support the extension tube with an overhead crane at the platform end of the boom.

**⚠WARNING**

Crushing hazard. The boom extension tube could fall when removed from the boom if not properly supported.

- 6 Support and slide the extension tube out of the primary boom tube. Place the extension tube on blocks for support.

**NOTICE**

During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

- 7 Remove the external snap rings from the slave cylinder barrel-end pivot pin.
- 8 Use a soft metal drift and drive the slave cylinder barrel-end pivot pin out.
- 9 Remove the slave cylinder from the primary extension boom tube.
- 10 Remove the external snap rings from the extension cylinder rod-end pivot pins at the platform end of the extension tube. Use a soft metal drift to remove the pins.
- 11 Support and slide the extension cylinder out of the pivot end of the boom extension tube. Place the extension cylinder on blocks for support.

**NOTICE**

During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

## PRIMARY BOOM COMPONENTS

REV B

**4-3****Primary Boom Lift Cylinder**

The primary boom lift cylinder raises and lowers the primary boom. The primary boom lift cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

**How to Remove the Primary Boom Lift Cylinder**

**⚠ WARNING** Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the secondary boom enough to access the primary boom lift cylinder barrel-end pivot pin.
  - 2 Raise the primary boom enough to access the primary boom lift cylinder rod-end pivot pin.
  - 3 Support the primary boom lift cylinder with a suitable lifting device. Place a block of wood across the upper secondary boom to support the cylinder when the rod-end pin is removed.
  - 4 Attach an overhead crane to the primary boom at the platform end for support. Raise the primary boom using the overhead crane just enough to relieve the pressure on the primary boom lift cylinder rod-end pivot pin.
  - 5 Remove the counterweight cover fasteners. Remove the counterweight cover from the machine.
  - 6 Place a block of wood between the counterweight plate on the leveling link and the cross member of the upper secondary boom. Carefully lower the secondary boom onto the block.
- ⚠ WARNING** Crushing hazard. Keep hands away from the block and all moving parts when lowering the secondary boom onto the block.
- 7 Remove the pin retaining fasteners from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
- ⚠ CAUTION** Crushing hazard. The primary boom lift cylinder may fall if not properly supported when the rod-end pivot pin is removed.
- 8 Lower the rod end of the cylinder onto the blocks that were placed on the upper secondary boom.
  - 9 Remove the pin retaining fastener from the ground control side upper secondary leveling link pivot pin at the upper pivot (same side of machine as the primary boom lift cylinder barrel-end pivot pin retainer).
  - 10 Place a rod through the upper secondary leveling link pivot pin at the upper pivot and twist to remove the pin.

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PRIMARY BOOM COMPONENTS

- 11 Swing the leveling link up out of the way and secure it from moving.
- 12 Tag, disconnect and plug the primary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 13 Support the barrel end of the primary boom lift cylinder with straps or ropes to restrict it from swinging freely.
- 14 Remove the pin retaining fastener from the primary boom lift cylinder barrel-end pivot pin. Do not remove the pivot pin.
- 15 Place a rod through the barrel-end pivot pin and twist to remove the pin.

**⚠ CAUTION** Crushing hazard. When the barrel-end pivot pin is removed, the primary boom lift cylinder may fall if not properly supported.

- 16 Attach an overhead crane or similar lifting device to the lug on the rod-end of the primary boom lift cylinder. Carefully loosen the straps and allow the primary boom lift cylinder to slowly swing down.
- 17 Carefully remove the cylinder from the machine.

**⚠ WARNING** Crushing hazard. The primary boom lift cylinder will fall if not properly supported when it is removed from the machine.

## 4-4

### Extension Cylinder

The extension cylinder extends and retracts the primary boom extension tube. The extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

### How to Remove the Extension Cylinder

**⚠ WARNING** Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the primary boom to the horizontal position. Extend the boom 3 to 4 feet / 1 m until the extension cylinder rod-end pivot pins are accessible.
- 2 Remove the external snap rings from the extension cylinder rod-end pivot pins. Use a soft metal drift to remove the pins.
- 3 Remove the counterweight cover fasteners. Remove the counterweight cover from the machine.
- 4 Raise the secondary boom until the master cylinder rod-end pivot pin is accessible.

## PRIMARY BOOM COMPONENTS

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- 5 Remove the primary boom extend drive limit switch from the pivot end of the primary boom. Do not disconnect the wiring.
- 6 Remove the retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
- 7 Manually retract the master cylinder and push it toward the platform end of the boom to obtain enough clearance for extension cylinder removal.
- 8 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 9 Remove the retaining fastener from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.
- 10 Carefully pull out and properly support the extension cylinder from the primary boom with a lifting strap from an overhead crane.

**⚠ WARNING** Crushing hazard. The cylinder could fall if not properly supported when it is pulled out of the extension tube.

**NOTICE** To make installation of the extension cylinder easier, be sure that the cylinder rod is extended 3 to 4 feet / 1 m.

**NOTICE** During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

## 4-5 Platform Leveling Master Cylinder

The platform leveling master cylinder acts as a pump for the slave cylinder. It is part of the closed-loop hydraulic circuit that keeps the platform level through the entire range of primary boom motion. The platform leveling master cylinder is located inside the upper mid-pivot at the pivot end of the primary boom.

## How to Remove the Platform Leveling Master Cylinder

**⚠ WARNING** Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

**NOTICE** Before cylinder removal is considered, bleed the cylinder to be sure that there is no air in the closed loop. See 2-2, *How to Bleed the Slave Cylinder*.

- 1 Remove the counterweight cover.
- 2 Raise the secondary boom until the master cylinder barrel-end pivot pin is above the turntable counterweights.

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## PRIMARY BOOM COMPONENTS

- 3 Raise the primary boom until the master cylinder rod-end pivot pin is accessible.
- 4 Attach an overhead crane to the pivot end of the primary boom for support. Do not lift it.
- 5 Secure the upper secondary boom to the pivot end of the primary boom with a strap (this will prevent the upper secondary boom from falling when the master cylinder barrel-end pivot pin is removed from the cylinder).
- 6 Tag, disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

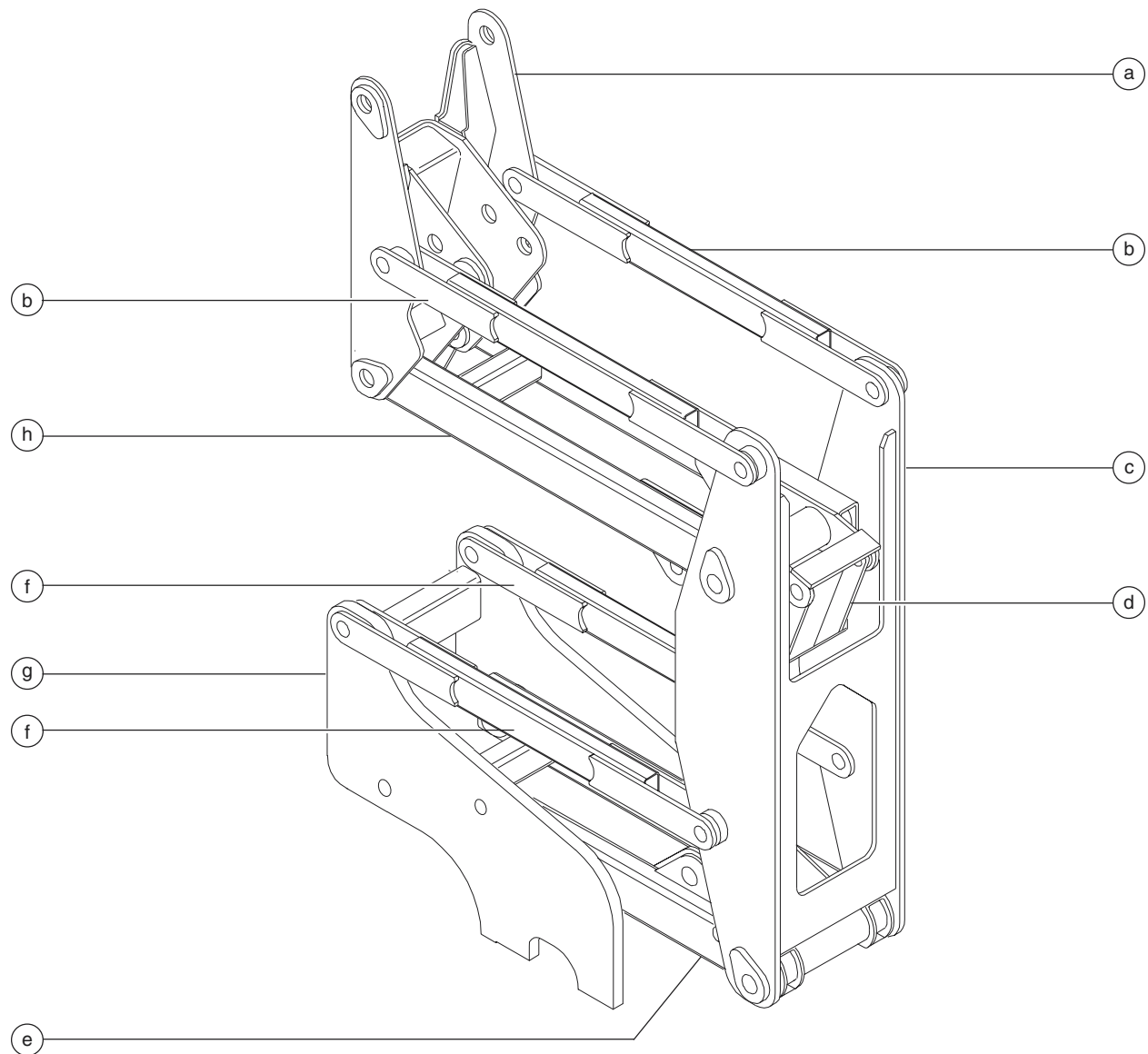
- 7 Attach a lifting strap from an overhead crane to the lug on the rod end of the master cylinder, then secure the strap to the primary boom (use this strap to lower the master cylinder out of the upper pivot).
- 8 Remove the pin retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
- 9 Remove the pin retaining fastener from the master cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin from the cylinder. Do not remove the pin from the upper pivot. Push the pin to one side, only far enough to remove the cylinder. The pin should remain in one side of the upper secondary boom and upper pivot.

**⚠ WARNING** Crushing hazard. The upper secondary boom and the upper pivot could fall if the pivot pin is completely removed.

- 10 Use the strap around the rod-end lug to lower the cylinder out of the machine.

# Secondary Boom Components

REV B



## Secondary Boom

- a upper pivot
- b upper compression arm
- c mid-pivot
- d compression link
- e lower secondary boom
- f lower compression arm
- g turntable pivot
- h upper secondary boom

REV B

## SECONDARY BOOM COMPONENTS

## 5-1 Secondary Boom

### How to Disassemble the Secondary Boom

**⚠ WARNING** Bodily injury hazard. The procedures in this section require specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the counterweight cover.
- 2 Place a suitable lifting device under the platform for support.
- 3 Disconnect the battery packs from the machine.
- 4 Remove the cable cover from the side of the jib boom.
- 5 Remove the wire loom from the cables at the platform control box.

- 6 Locate the cables from the primary boom cable track to the platform control box. Number each cable and its entry location at the platform control box.

- 7 Open the platform control box.

- 8 Tag and disconnect each wire from the cables in the platform control box.

**⚠ WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 9 Pull the cables out of the platform control box.
- 10 Pull all of the electrical cables out of the plastic cable track. Do not pull out the hydraulic hoses.
- 11 Remove the hose clamps from the bottom side of the primary boom.
- 12 **Before serial number 5945:** Tag, disconnect and plug the platform rotator hydraulic hoses at the union located on the bottom side of the primary boom. Cap the fittings on the union.

**After serial number 5944:** Tag, disconnect and plug the hydraulic hoses from the "P" and "T" ports at the jib boom/rotate manifold. Cap the fittings on the manifold.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

## SECONDARY BOOM COMPONENTS

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- 13 Remove the hose clamp from the side of the primary boom at the pivot end.
- 14 Remove the primary boom extend drive speed limit switch (LS1) mounted on the side of the primary boom at the pivot end. Do not disconnect the wiring.
- 15 Attach a lifting strap from an overhead crane to the pivot end of the primary boom.
- 16 Carefully lift the secondary and primary boom assembly with the overhead crane until the master cylinder and primary boom lift cylinder hydraulic hoses are accessible.
- 17 Remove the cable covers from the top of the upper secondary boom.
- 18 Tag, disconnect and plug the primary boom lift cylinder and master cylinder hydraulic hoses. Cap the fittings on the cylinders.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 19 Lower the secondary boom to the fully stowed position.
- 20 Pull all the cables and hoses through the upper pivot.

**⚠ CAUTION** Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

- 21 Position a lifting strap from the overhead crane approximately 2 feet / 60 cm from the platform end of the primary boom. Measure from the platform end of the primary boom tube.
- 22 Remove the pin retaining fasteners from the upper pivot to upper secondary compression arm pivot pins. Use a soft metal drift to remove the pins.
- 23 Swing the compression arms down and out of the way. Secure them from moving.
- 24 Remove the pin retaining fasteners from the upper pivot to the upper secondary boom pivot pin. Use a soft metal drift to remove the pin.
- 25 Carefully remove the entire primary boom assembly from the machine (primary boom assembly, jib boom assembly, platform, master cylinder, primary lift cylinder and upper pivot).

**⚠ WARNING** Crushing hazard. The primary boom assembly could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane. Do not remove the assembly from the machine until it is properly balanced.

**NOTICE** During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

- 26 Place the entire assembly onto a structure capable of supporting it.

REV B

## SECONDARY BOOM COMPONENTS

27 Remove the pin retaining fasteners from the upper secondary compression arm pivot pins. Do not remove the pins.

28 Position a lifting strap from an overhead crane at the center of the control box side upper secondary compression arm.

29 Use a soft metal drift to remove the upper secondary boom compression arm pivot pins and remove the compression arm from the machine. Repeat this step for the hydraulic tank side upper secondary compression arm.

**▲WARNING** Crushing hazard. The upper secondary compression arm could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

30 Close the hydraulic tank shutoff valve. Tag, disconnect and plug the hydraulic hose from the hydraulic tank shutoff valve.

**▲WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

31 Open the valve on the hydraulic tank and drain the oil into a container of suitable capacity. Refer to Section 2, *Specifications*.

**▲CAUTION** Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

32 Tag, disconnect and plug the hydraulic hose from the hydraulic tank return filter housing. Cap the fitting on the filter housing.

**▲WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

**▲CAUTION** Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

33 Remove the hydraulic tank mounting fasteners. Remove the hydraulic tank from the machine.

34 Open the ground controls side turntable cover.

35 Remove the terminal strip cover retaining fasteners. Remove the cover.

36 Remove the terminal strip retaining fasteners. Do not disconnect the wiring.

37 Remove the plastic plug in the bulkhead to access the secondary boom lift cylinder rod-end pivot pin.

38 Remove the pin retaining fastener from the rod end of the secondary boom lift cylinder. Use a soft metal drift to remove the pin through the access holes in the bulkheads. Secure the cylinder from moving.

39 Remove the pin retaining fastener from the lower pivot pin on the compression link. Use a soft metal drift to remove the pin.

## SECONDARY BOOM COMPONENTS

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40 Attach a lifting strap from an overhead crane to the upper secondary boom.

41 Remove the pin retaining fastener from the mid-pivot to upper secondary boom pivot pin. Use a soft metal drift to remove the pin.

42 Remove the upper secondary boom with compression link from the machine.

**⚠ WARNING** Crushing hazard. The upper secondary boom with compression link could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

43 Remove the mounting fasteners from the counterweight attached to the lower leveling link.

44 Attach a lifting strap from an overhead crane to the counterweight. Remove the counterweight from the lower leveling link.

**⚠ DANGER** Tip-over hazard. The counterweight is critical to machine stability. If the counterweight is not installed during re-assembly of the machine, the machine will become unstable and tip over.

**⚠ WARNING** Crushing hazard. The counterweight could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

45 Remove the mounting fasteners from the function manifold and slide the function manifold to the side. This will allow access to the secondary boom lift cylinder barrel-end pivot pin.

46 Remove the mounting fasteners from the auxiliary power unit. Do not disconnect the electrical cables or hydraulic hoses.

47 Slide the auxiliary power unit to the side to access the other secondary boom lift cylinder barrel-end pivot pin.

48 Remove the retaining fasteners from the secondary boom lift cylinder barrel-end pivot pins.

49 Attach a lifting strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.

50 Tag, disconnect and plug the hydraulic hoses from the secondary boom lift cylinder. Cap the fittings on the cylinder.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

51 Use a slide hammer to remove the barrel-end pivot pins (access the pins from the access holes in the bulkheads, one on each side). Remove the secondary boom lift cylinder from the machine.

**⚠ WARNING** Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

REV B

## SECONDARY BOOM COMPONENTS

52 Attach a lifting strap from an overhead crane to the mid-pivot for support.

53 Remove the pin retaining fasteners from the mid-pivot to the lower secondary compression arm pivot pins. Use a slide hammer and remove the pins. Lower the compression arms down.

54 Remove the pin retaining fasteners from the mid-pivot to the lower secondary boom pivot pin. Use a soft metal drift to remove the pins.

55 Remove the mid-pivot from the machine.

**⚠ WARNING** Crushing hazard. The mid-pivot could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

56 Remove the secondary boom drive speed limit switch (LS4) mounted to the turntable riser on the ground controls side. Do not disconnect the wiring.

57 Attach a lifting strap from an overhead crane to the ground control side lower secondary boom compression arm.

58 Remove the pin retaining fastener from the lower secondary boom compression arm to turntable riser pivot pin.

59 Use a slide hammer and remove the pin. Remove the compression arm from the machine. Repeat for the hydraulic tank side lower secondary boom compression arm.

**⚠ WARNING** Crushing hazard. The lower secondary compression arm could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

60 Attach a lifting strap from an overhead crane to the lower secondary boom.

61 Remove the pin retaining fastener from the lower secondary boom to turntable riser pivot pin. Use a soft metal drift to remove the pin.

62 Remove the lower secondary boom from the machine.

**⚠ WARNING** Crushing hazard. The lower secondary boom could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

## SECONDARY BOOM COMPONENTS

REV B

**5-2****Secondary Boom Lift Cylinder**

The secondary boom lift cylinder raises and lowers the secondary boom. The secondary boom lift cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

**How to Remove the Secondary Boom Lift Cylinder**

**⚠ WARNING** Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Rotate the turntable to either side until the boom is centered between the steer and non-steer tires.
- 2 Raise the primary boom to full height. Do not extend it.
- 3 Swing out the battery pack that is directly below the secondary boom lift cylinder.
- 4 Disconnect the battery packs from the machine.

- 5 Open the hydraulic tank side turntable cover.

- 6 Tag and disconnect the power cables on the auxiliary power unit.

**⚠ WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 7 Close the hydraulic tank shutoff valve. Tag and disconnect and plug the hydraulic hose from the hydraulic tank shutoff valve.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 8 Open the valve on the hydraulic tank and drain the oil into a container of suitable capacity. Refer to Section 2, *Specifications*.

**⚠ CAUTION** Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

- 9 Tag, disconnect and plug the hydraulic hose from the hydraulic tank return filter housing. Cap the fitting on the filter housing.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

**⚠ CAUTION** Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

## REV B

## SECONDARY BOOM COMPONENTS

- 10 Remove the hydraulic tank mounting fasteners. Remove the hydraulic tank from the machine.
- 11 Open the ground controls side turntable cover.
- 12 Remove the terminal strip cover retaining fasteners. Remove the cover.
- 13 Remove the terminal strip retaining fasteners. Do not disconnect the wiring.
- 14 Remove the plastic plug in the bulkhead to access the secondary boom lift cylinder rod-end pivot pin.
- 15 Remove the mounting fasteners from the function manifold and slide the manifold to the side. This will allow access to the hydraulic tank side barrel-end pivot pin.
- 16 Attach a lifting strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.
- 17 From the bottom side of the cylinder, remove the retaining fasteners from the secondary boom lift cylinder barrel-end pivot pins.
- 18 Remove the hose clamp under the lower secondary boom.
- 19 Use a slide hammer to remove both barrel-end pivot pins (access the pins from the access holes in the bulkheads, one on each side).
- 20 Remove the pin retaining fastener from the secondary boom lift cylinder rod-end pivot pin.

- 21 Use a soft metal drift to remove the secondary boom rod-end pivot pin.

**CAUTION** Crushing hazard. The secondary boom lift cylinder may fall when the rod-end pivot pin is removed if not properly supported by the overhead crane.

- 22 Carefully lower the cylinder down through the secondary boom, enough to access the hydraulic hoses. Do not pinch the hoses.

**CAUTION** Component damage hazard. Hoses can be damaged if they are kinked or pinched.

- 23 Tag, disconnect and plug the hydraulic hoses from the secondary boom lift cylinder. Cap the fittings on the cylinder.

**WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 24 Remove the cylinder through the top of the secondary boom.

**WARNING** Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

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# Hydraulic Pumps

REV A

## 6-1

### Auxiliary and Function Pump

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#### How to Remove the Auxiliary Pump or Function Pump

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

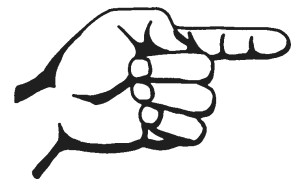
- 1 Close the hydraulic shutoff valve located at the hydraulic tank.

**CAUTION** Component damage hazard. The machine must not be operated with the hydraulic tank shutoff valve in the closed position or component damage will occur. If the tank valve is closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

- 2 Tag, disconnect and plug the hydraulic hoses from the pump. Cap the fittings on the pump.

**⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the pump mounting bolts from the pump. Carefully remove the pump from the electric motor.



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# Manifolds

REV B

## 7-1

### Function Manifold Components

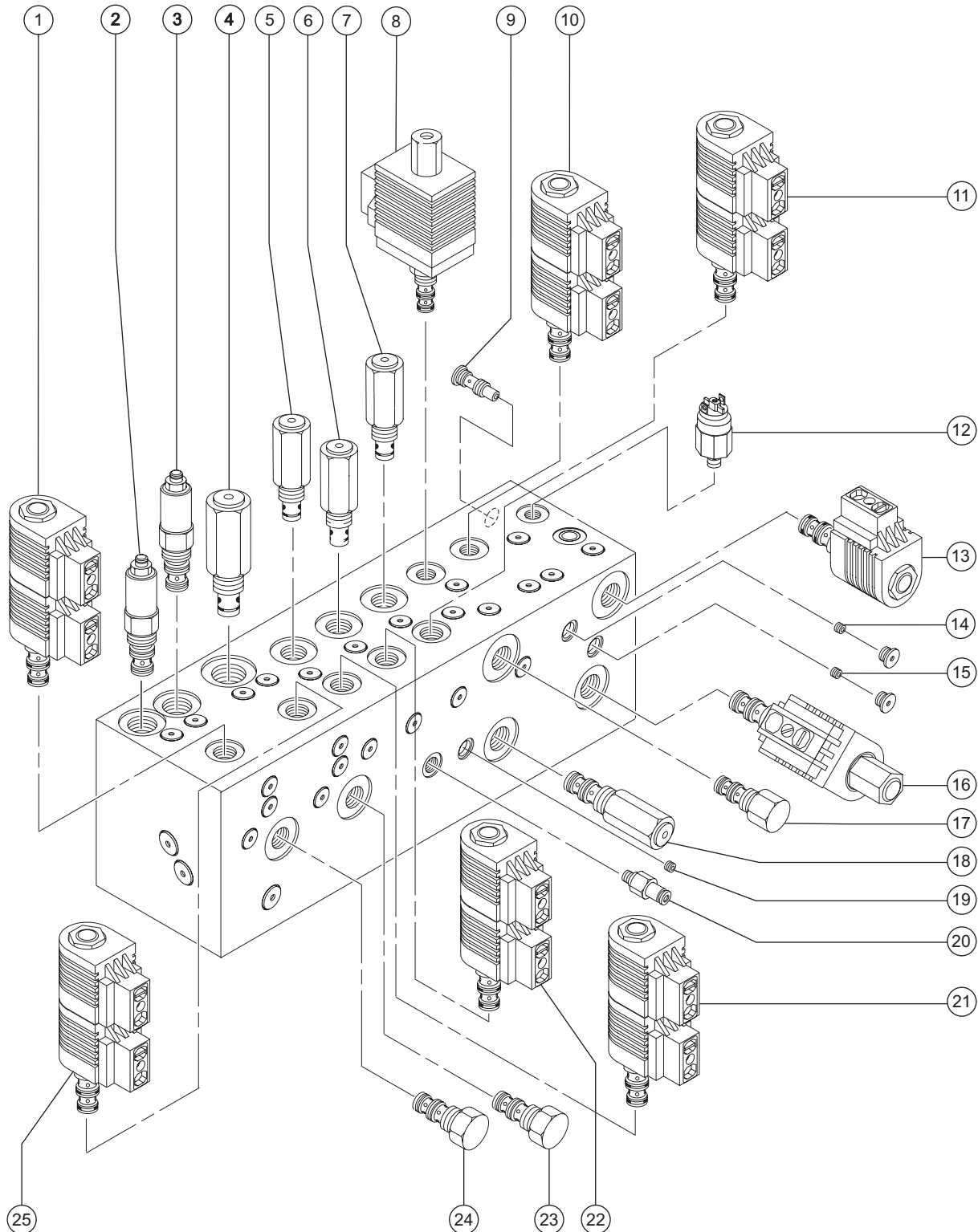
The function manifold is located behind the ground controls turntable cover.

| Index No. | Description                             | Schematic Item | Function                             | Torque                  |
|-----------|-----------------------------------------|----------------|--------------------------------------|-------------------------|
| 1         | Solenoid valve, 3 position 4 way .....  | A .....        | Platform level up/down .....         | 20-25 ft-lbs / 27-34 Nm |
| 2         | Counterbalance valve .....              | B .....        | Platform level down .....            | 20-25 ft-lbs / 27-34 Nm |
| 3         | Counterbalance valve .....              | C .....        | Platform level up .....              | 20-25 ft-lbs / 27-34 Nm |
| 4         | Relief valve, 1100 psi / 75.8 bar ..... | D .....        | Turntable rotate left/right .....    | 30-35 ft-lbs / 41-47 Nm |
| 5         | Relief valve, 1600 psi / 110 bar .....  | E .....        | Secondary boom down .....            | 20-25 ft-lbs / 27-34 Nm |
| 6         | Relief valve, 1600 psi / 110 bar .....  | F .....        | Primary boom down .....              | 20-25 ft-lbs / 27-34 Nm |
| 7         | Relief valve, 1800 psi / 124 bar .....  | G .....        | Primary boom extend .....            | 20-25 ft-lbs / 27-34 Nm |
| 8         | Proportional solenoid valve .....       | H .....        | System flow regulating circuit ..... | 30-35 ft-lbs / 41-47 Nm |
| 9         | Check valve .....                       | I .....        | Brake circuit .....                  | 10-12 ft-lbs / 14-16 Nm |
| 10        | Solenoid valve, 3 position 4 way .....  | J .....        | Steer left/right .....               | 20-25 ft-lbs / 27-34 Nm |
| 11        | Solenoid valve, 3 position 4 way .....  | K .....        | Primary boom extend/retract .....    | 20-25 ft-lbs / 27-34 Nm |
| 12        | Pressure switch .....                   | L .....        | Brake circuit                        |                         |
| 13        | Solenoid valve, N.C. poppet .....       | M .....        | Brake circuit .....                  | 20-25 ft-lbs / 27-34 Nm |
| 14        | Orifice, 0.045 inch / 1.14 mm .....     | N .....        | Brake circuit                        |                         |

**This list continues. Please turn the page.**

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# MANIFOLDS



## MANIFOLDS

REV B

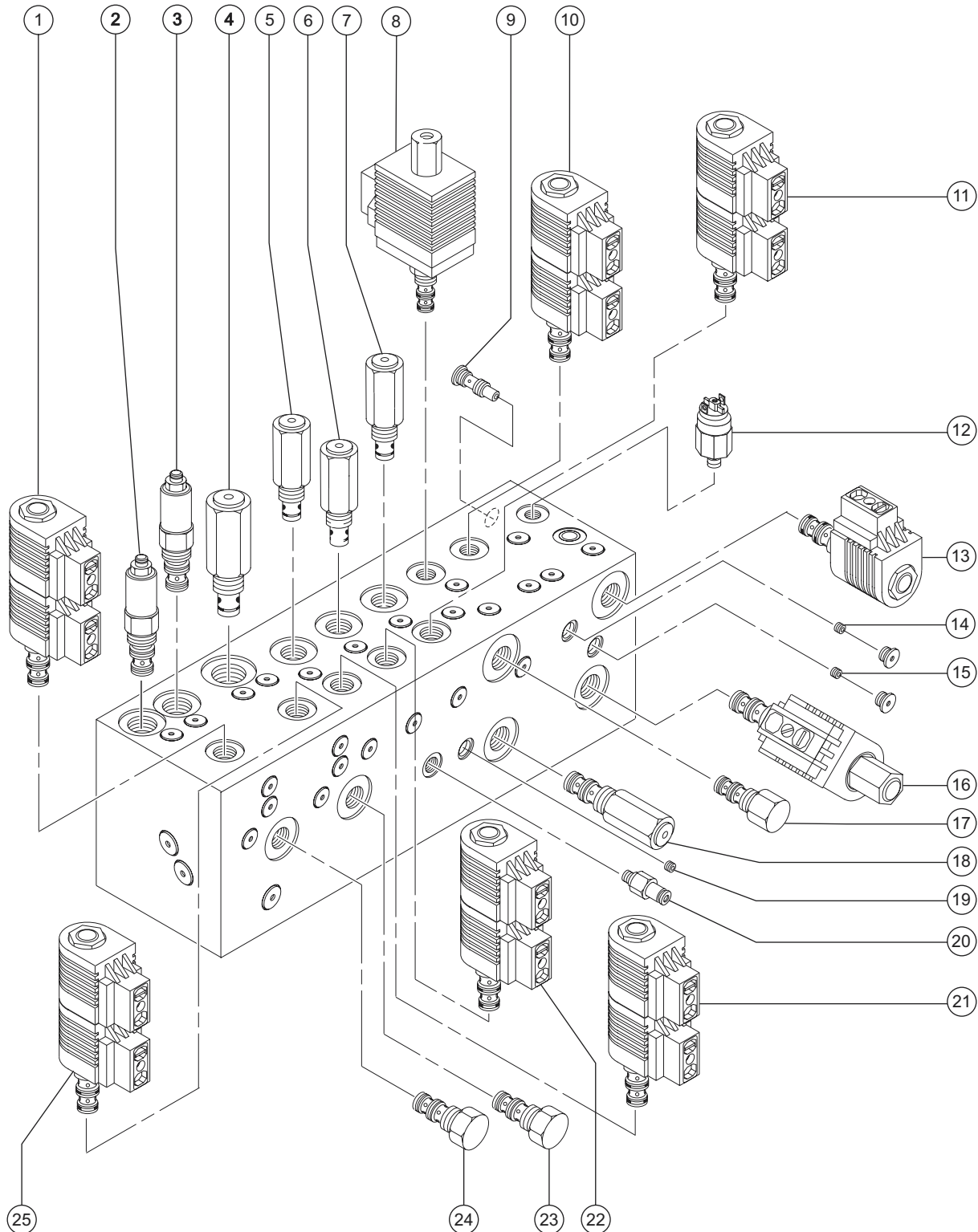
## Function Manifold Components, continued

The function manifold is located behind the ground controls turntable cover.

| Index<br>No. | Description                                        | Schematic |                                        | Torque                  |
|--------------|----------------------------------------------------|-----------|----------------------------------------|-------------------------|
|              |                                                    | Item      | Function                               |                         |
| 15           | Orifice, 0.045 inch / 1.14 mm .....                | O .....   | Brake and steer circuit                |                         |
| 16           | Solenoid valve, N.O. poppet .....                  | P .....   | Brake circuit .....                    | 20-25 ft-lbs / 27-34 Nm |
| 17           | Differential sensing valve .....                   | Q .....   | Differential sensing circuit .....     | 30-35 ft-lbs / 41-47 Nm |
| 18           | Relief valve, 2800 psi / 193 bar .....             | R .....   | System relief .....                    | 20-25 ft-lbs / 27-34 Nm |
| 19           | Orifice, 0.035 inch / 0.89 mm .....                | S .....   | Tank return circuit                    |                         |
| 20           | Diagnostic fitting .....                           | T .....   | Testing                                |                         |
| 21           | Solenoid valve, 3 position 4 way .....             | U .....   | Secondary boom up/down .....           | 20-25 ft-lbs / 27-34 Nm |
| 22           | Solenoid valve, 3 position 4 way .....             | V .....   | Primary boom up/down .....             | 20-25 ft-lbs / 27-34 Nm |
| 23           | Flow regulator valve,<br>1.5 gpm / 5.7 L/min ..... | W .....   | Turntable rotate circuit .....         | 20-25 ft-lbs / 27-34 Nm |
| 24           | Flow regulator valve,<br>0.8 gpm / 3 L/min .....   | X .....   | Jib boom/platform rotate circuit ..... | 20-25 ft-lbs / 27-34 Nm |
| 25           | Solenoid valve, 3 position 4 way .....             | Y .....   | Turntable rotate left/right .....      | 20-25 ft-lbs / 27-34 Nm |

REV B

MANIFOLDS



## MANIFOLDS

REV B

## 7-2 Valve Adjustments - Function Manifold

### How to Adjust the System Relief Valve

**NOTICE** Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.
- 2 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position.
- 3 Move and hold the function enable toggle switch to either side and move and hold the primary boom extend/retract toggle switch in the retract direction with the primary boom fully retracted. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 4 Turn the machine off. Hold the system relief valve with a wrench and remove the cap (item R).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

### How to Adjust the Primary Boom Down Relief Valve

**NOTICE** Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the test port on the function manifold.
- 2 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position.
- 3 Move and hold the function enable toggle switch to either side and move and hold the primary boom up/down toggle switch in the down direction with the primary boom fully lowered. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 4 Turn the machine off. Hold the primary down relief valve with a wrench and remove the cap (item F).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

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MANIFOLDS

## How to Adjust the Secondary Boom Down Relief Valve

**NOTICE** Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the test port on the function manifold.
- 2 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position.
- 3 Move and hold the function enable toggle switch to either side and move and hold the secondary boom up/down toggle switch in the down direction with the secondary boom fully lowered. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 4 Turn the machine off. Hold the secondary boom down relief valve with a wrench and remove the cap (item E).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

## How to Adjust the Primary Boom Extend Relief Valve

**NOTICE** Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the test port on the function manifold.
- 2 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position.
- 3 Move and hold the function enable toggle switch to either side and move and hold the primary boom extend/retract toggle switch in the extend direction with the primary boom fully extended. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 4 Turn the machine off. Hold the primary boom extend relief valve with a wrench and remove the cap (item G).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valves higher than specified.

- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

## MANIFOLDS

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## How to Adjust the Turntable Rotate Relief Valve

**NOTICE** Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the test port on the function manifold.
- 2 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position.
- 3 Move and hold the function enable toggle switch to either side and move and hold the turntable rotate toggle switch in the right direction (until turntable stops against the rotation stop). Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 4 Turn the machine off. Hold the turntable relief valve(s) with a wrench and remove the cap (item D).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

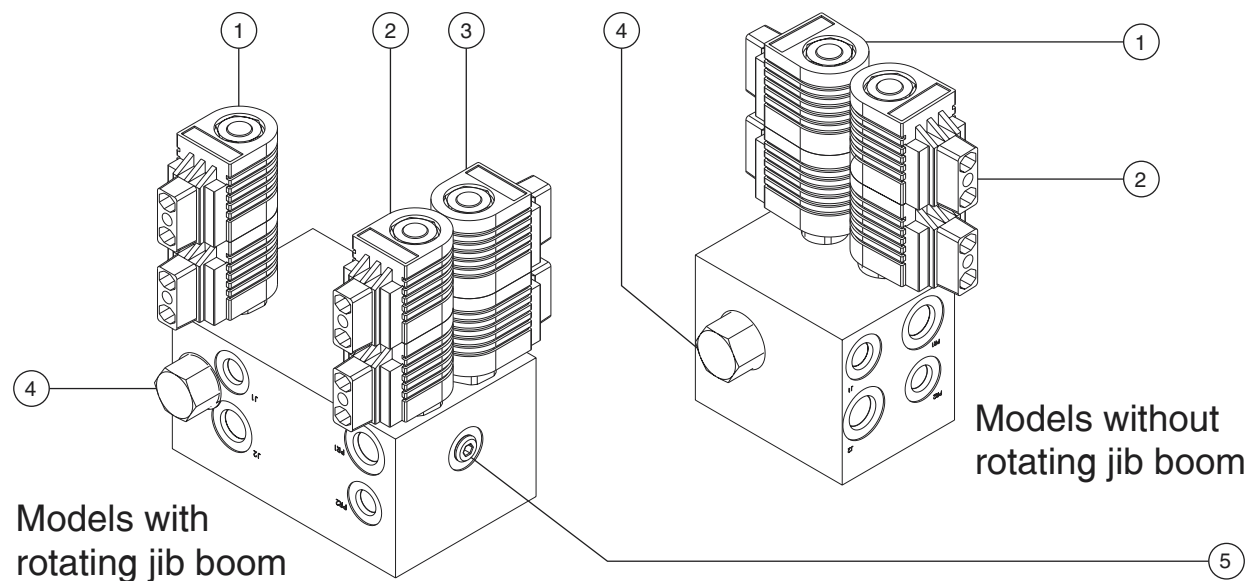
REV B

MANIFOLDS

**7-3****Jib Boom and Platform / Jib Boom Rotate Manifold Components**

The jib boom/platform rotate manifold is mounted to the jib boom.

| Index No. | Description                                                    | Schematic Item | Function                         | Torque                  |
|-----------|----------------------------------------------------------------|----------------|----------------------------------|-------------------------|
| 1         | Solenoid valve, 3 position 4 way .....                         | AA .....       | Jib boom up/down .....           | 20-25 ft-lbs / 27-34 Nm |
| 2         | Solenoid valve, 3 position 4 way .....                         | BB .....       | Platform rotate left/right ..... | 20-25 ft-lbs / 27-34 Nm |
| 3         | Solenoid valve, 3 position 4 way .....                         | CC .....       | Jib boom rotate left/right ..... | 20-25 ft-lbs / 27-34 Nm |
| 4         | Flow regulator valve,<br>0.3 gpm / 1.14 L/min .....            | EE .....       | Platform rotate circuit .....    | 20-25 ft-lbs / 27-34 Nm |
| 5         | Orifice plug, 0.025 inch / 0.64 mm ...<br>(located under plug) | DD .....       | Jib boom rotate circuit          |                         |



## MANIFOLDS

REV B

## 7-4 Valve Coils

### How to Test a Coil

A properly functioning coil provides an electromotive force which operates the solenoid valve. Critical to normal operation is continuity within the coil that provides this force field.

**⚠ WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Tag and disconnect the wiring from the coil to be tested.
- 2 Test the coil resistance.

**Coils with 2 terminals:** Connect the leads from the ohmmeter to the valve coil terminals.

**Coils with 1 terminal:** Connect the positive lead from the ohmmeter to the valve coil terminal, then connect the negative lead from the ohmmeter to the internal ring of the valve coil.

- ⦿ Result: The resistance should be within specification, plus or minus 30%.
- ⦿ Result: If the resistance is not within specification, plus or minus 30%, replace the coil.

#### Valve Coil Resistance Specification

| Description                                                                                | Specification |
|--------------------------------------------------------------------------------------------|---------------|
| Solenoid valve, 3 position 4 way, 20V DC (schematic items A, J, K, U, V, Y, AA, BB and CC) | 22 $\Omega$   |
| Proportional solenoid valve, 24V DC (schematic item H)                                     | 19.5 $\Omega$ |
| Solenoid valve, N.C. poppet, 20V DC (schematic item M)                                     | 23.5 $\Omega$ |
| Solenoid valve, N.O. poppet, 20V DC (schematic item P)                                     | 23.5 $\Omega$ |

### How to Test a Coil Diode

Genie incorporates spike suppressing diodes in all of its valve coils. Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

**⚠ WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Test the coil for resistance. See *How to Test a Coil*.
- 2 Connect a 10 $\Omega$  resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

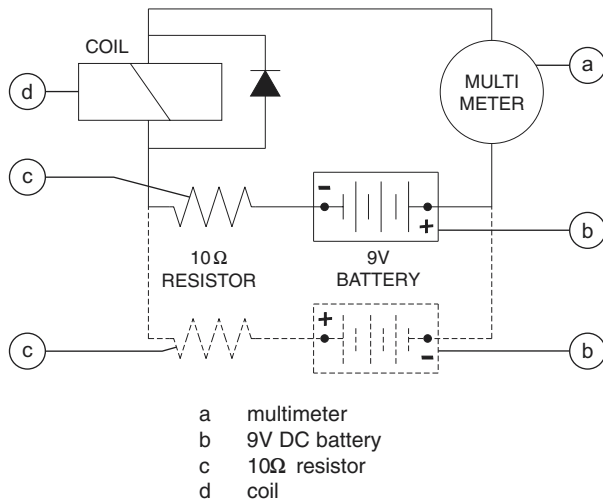
**NOTICE** The battery should read 9V DC or more when measured across the terminals.

#### Resistor, 10 $\Omega$

Genie part number 27287

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MANIFOLDS



Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

- 3 Set a multimeter to read DC current.

**NOTICE** The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

- 4 Connect the negative lead to the other terminal on the coil.

**NOTICE** If testing a single-terminal coil, connect the negative lead to the internal metallic ring at either end of the coil.

- 5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the amperage reading.
- 6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

- ⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.
- ✗ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

---

# Turntable Rotation Components

REV B

## 8-1

### Turntable Rotation Hydraulic Motor

---

The turntable rotation hydraulic motor is the only serviceable component of the turntable rotation assembly. The worm gear must not be removed from the housing. In order to remove the housing, the turntable has to be removed.

#### How to Remove the Turntable Rotation Motor

**NOTICE** When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Tag, disconnect and plug the hydraulic hoses from the turntable rotation motor. Cap the fittings on the motor.

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 2 Remove the turntable rotation motor mounting bolts. Remove the motor from the machine.

# Steer Axle Components

REV A

## 9-1 Hub and Bearings

### How to Remove the Hub and Bearings

- 1 Loosen the wheel lug nuts. Do not remove them.
- 2 Block the non-steer wheels and place a lifting jack under the steer axle.
- 3 Raise the machine. Place blocks under the drive chassis for support.
- 4 Remove the lug nuts. Remove the tire and wheel assembly.
- 5 Remove the dust cap, cotter pin and castle nut.

**NOTICE** Always use a new cotter pin when installing a castle nut.

- 6 Pull the hub off the yoke spindle. The washer and outer bearing should fall loose from the hub.
- 7 Place the hub on a flat surface and gently pry the grease seal out of the hub. Remove the inner bearing.

**NOTICE** When removing a bearing, always use a new inner bearing seal.

### How to Install the Hub and Bearings

**NOTICE** When replacing a wheel bearing, both the inner and outer bearings, including the pressed-in races, must be replaced.

- 1 Be sure that both bearings are packed with grease.
- 2 Place the large inner bearing into the rear of the hub.
- 3 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.

**NOTICE** Always replace the bearing grease seal when removing the hub.

- 4 Slide the hub onto the spindle.

**CAUTION** Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

- 5 Place the outer bearing into the hub.
- 6 Install the washer and castle nut.
- 7 Tighten the castle nut to 35 ft-lbs / 47 Nm to seat the bearings.
- 8 Loosen the castle nut, then tighten to 8 ft-lbs / 11 Nm.
- 9 Install a new cotter pin. Bend the cotter pin to lock it in place.

**NOTICE** Always replace the cotter pin with a new one when removing the castle nut or when checking the torque of the castle nut.

- 10 Install the dust cap.
- 11 Install the tire and wheel assembly.
- 12 Lower the machine and remove the blocks.
- 13 Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications*.

# Motor Controller

REV A

## 10-1 Motor Controller

The drive motor controller is located under the non-steer end drive chassis cover. The drive motor controller can recognize machine drive malfunctions and display motor controller fault codes by flashing an LED at the ground controls and on the motor controller. See the Troubleshooting section of this manual for a list of fault codes and additional information. There are no adjustments needed on the drive joystick. For further information or assistance, consult the Genie Industries Service Department.

### How to Test the Motor Controller

**NOTICE** Use the following procedure to test the motor controller. If the motor controller is found to be faulty, note which test failed and which fault code (if any) was present at the time of failure.

- 1 Turn the key switch to the off position. Disconnect the battery packs from the machine.
- 2 Remove the drive chassis cover fasteners from the non-steer end of the machine. Remove the drive chassis cover.
- 3 Discharge the capacitors inside the motor controller by connecting a 10-50  $\Omega$  resistor or the coil of a 24V DC relay between the B+ and B- terminals of the motor controller. Hold for approximately 5-10 seconds.

**⚠ WARNING** Electrocuting hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 4 Tag and disconnect all power cables from the motor controller.
  - 5 Press the release tab on the motor controller harness connector and remove the motor controller harness connector from the motor controller.
  - 6 Connect the leads from an ohmmeter to test each motor controller terminal combination listed below. Check for resistance.
- ⓘ Result: All desired results must be 500 kilohms or more. If any test has a result of less than 500 kilohms, replace the motor controller.

| Test         | Desired result<br>(in kilohms) |
|--------------|--------------------------------|
| F1 to F2     | 500k $\Omega$ or more          |
| F1 to B-     | 500k $\Omega$ or more          |
| F1 to M-     | 500k $\Omega$ or more          |
| F1 to B+     | 500k $\Omega$ or more          |
| F2 to B-     | 500k $\Omega$ or more          |
| F2 to M-     | 500k $\Omega$ or more          |
| F2 to B+     | 500k $\Omega$ or more          |
| B- to M-     | 500k $\Omega$ or more          |
| M- to B+     | 500k $\Omega$ or more          |
| Pin 17 to B- | 500k $\Omega$ or more          |
| Pin 20 to B- | 500k $\Omega$ or more          |

# Fault Codes



## Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in stowed position
  - Turntable rotated with the boom between the non-steer wheels
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power supply disconnected from the machine

## Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the *Genie Z-30/20N Operator's Manual* on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

### **⚠ DANGER**

Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

### **⚠ WARNING**

Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

### **⚠ WARNING**

Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

### **NOTICE**

Perform all troubleshooting on a firm, level surface.

### **NOTICE**

Two persons will be required to safely perform some troubleshooting procedures.

## FAULT CODES

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**⚠ DANGER** Tip-over hazard. When adjusting the raised drive speed settings, the maximum raised drive speed must not exceed 0.6 mph / 1Km/h or 40 feet/45 seconds / 12.2 meters / 45 seconds. If the machine is allowed to drive faster than specification, the machine could become unstable and will tip over.

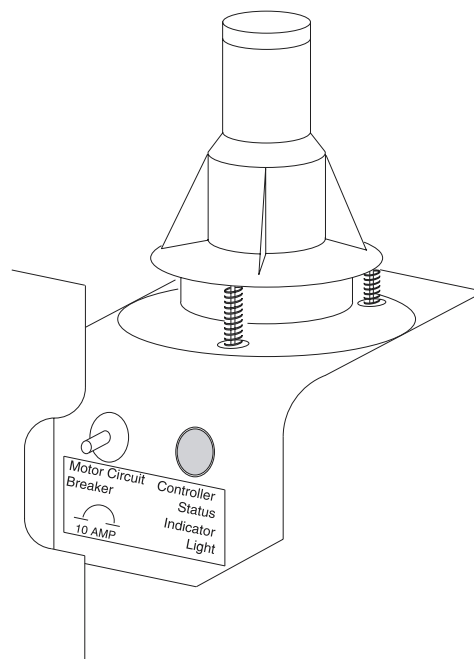
**NOTICE** Additional troubleshooting of the fault codes may be accomplished by using the hand-held pendant motor controller programmer (Genie part number 56303).

**NOTICE** When using the hand-held pendant motor controller programmer, the M1 MAX SPEED needs to be set to 33. If needed, adjust the M1 MAX SPEED higher or lower to achieve the maximum raised drive speed of 0.6 mph / 1Km/h or 40 feet / 45 seconds / 12.2 meters / 45 seconds.

The controller status indicator light will flash a fault code to aid in troubleshooting. This indicator light is mounted on the tilt level sensor mounting bracket, located behind the cover on the ground controls side.

Fault codes are two digits. The controller status indicator light will blink the first digit of a two digit code, pause for 1 second, and then blink the second digit. There will be a 2 second pause between codes.

For example: the indicator light blinks 4 consecutive times, pauses for 1 second, and then blinks 1 time. That would indicate Fault Code 41.



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# Fault Code Chart

| Fault Code                                       | Programmer Diagnostic Display | Condition               | Possible Causes                                                                                                                                | Solution                                                                                                                                                                                                                      |
|--------------------------------------------------|-------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fault code LED is off or is on, but not blinking | COMMUNICATION ERROR           | Machine will not drive. | The key switch or Emergency Stop button(s) was cycled on and off faster than 5 seconds OR controller sensed an internal error during start up. | Push in the ground control red Emergency Stop button to the off position and wait for 5 seconds. Pull out the ground control red Emergency Stop button to the on position. If problem persists, replace the motor controller. |
| 01                                               |                               | Normal operation.       |                                                                                                                                                |                                                                                                                                                                                                                               |
| 12                                               | HW FAILSAFE 1-2-3             | Machine will not drive. | The motor controller failed self test.                                                                                                         | Replace the motor controller.                                                                                                                                                                                                 |
| 13                                               | M- SHORTED                    | Machine will not drive. | The motor controller has a internal short between M- and B- terminals.                                                                         | Test the motor controller. See Repair Section.                                                                                                                                                                                |
|                                                  | FIELD OPEN                    | Machine will not drive. | Motor wiring is loose OR motor is defective OR motor controller has an internal short.                                                         | Check for loose or open connections at the drive motors and motor controller OR replace the defective drive motor OR test the motor controller. See Repair Section.                                                           |
|                                                  | ARM SENSOR                    | Machine will not drive. | Defective motor controller.                                                                                                                    | Replace the motor controller.                                                                                                                                                                                                 |
|                                                  | FLD SENSOR                    | Machine will not drive. | Defective motor controller.                                                                                                                    | Replace the motor controller.                                                                                                                                                                                                 |

## FAULT CODE CHART

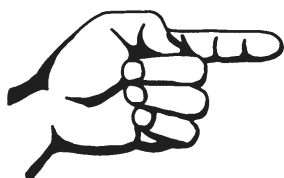
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| Fault Code | Programmer Diagnostic Display | Condition               | Possible Causes                                                                                                                                                                                                                                                          | Solution                                                                                                                                                                                        |
|------------|-------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21         | THROTTLE FAULT 1              | Machine will not drive. | Open in wht/red wire #32 at pin 14 or red/wht wire #29 at pin 16 on the motor controller going from drive joystick to pins 14 and 16 at the motor controller OR pin 14 is internally shorted to power or ground OR the potentiometer on the drive joystick is defective. | Consult Genie Industries Service Department.                                                                                                                                                    |
|            | THROTTLE FAULT 2              | Machine will not drive. | Pin 14 (wht/red #32) is shorted to power or ground OR the potentiometer on the drive joystick is defective.                                                                                                                                                              | Consult Genie Industries Service Department.                                                                                                                                                    |
| 31         | CONT DRVR OC                  | Machine will not drive. | Main contactor (PR1) coil defective OR brake release relay CR5 defective.                                                                                                                                                                                                | Replace main contactor PR1 or brake release relay CR5 OR replace the motor controller.                                                                                                          |
| 32         | MAIN CONT WELDED              | Machine will not drive. | Main contactor (PR1) contacts stuck closed OR grn wire at pin 17 on motor controller shorted to ground OR open in motor armature wiring OR motor controller has an internal short to ground.                                                                             | Consult Genie Industries Service Department.                                                                                                                                                    |
| 33         | PRECHARGE FAULT               | Machine will not drive. | External short between B+ terminal on motor controller and ground OR motor controller is defective.                                                                                                                                                                      | Repair short between B+ terminal on motor controller and ground OR replace motor controller.<br>Note: Short can be on any part of circuit connected to the B+ terminal on the motor controller. |

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## FAULT CODE CHART

| Fault Code | Programmer Diagnostic Display | Condition               | Possible Causes                                                                                                                                                                          | Solution                                                                                                                                                                                                                |
|------------|-------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 34         | MISSING CONTACTOR             | Machine will not drive. | Motor controller does not detect the main contactor PR1 or brake release relay CR5.                                                                                                      | Consult Genie Industries Service Department.                                                                                                                                                                            |
|            | MAIN CONT DNC                 | Machine will not drive. | Main contactor PR1 or brake release relay CR5 did not close OR open in org/red wire to PR1 and/or CR5 OR main contactor and/or brake release relay is defective.                         | Consult Genie Industries Service Department.                                                                                                                                                                            |
| 41         | LOW BATTERY VOLTAGE           | Machine will not drive. | Battery supply voltage to motor controller less than 32V DC.                                                                                                                             | Completely charge batteries OR check battery cable condition OR check for corrosion or loose connections at battery terminals and motor controller.                                                                     |
| 42         | OVERVOLTAGE                   | Machine will not drive. | Battery supply voltage to motor controller more than 55V DC OR machine is being operated with the battery charger plugged in.                                                            | Be sure the battery charger is disconnected OR check for loose battery cables or poor connections.                                                                                                                      |
| 43         | THERMAL CUTBACK               | Machine will not drive. | Machine being operated outside of temperature range of -13°F to 185°F / -25°C to 85°C OR machine being driven under excessive load OR motor controller is not being cooled sufficiently. | Operate machine within specified temperature limits OR check for debris around motor controller preventing proper cooling of the controller OR check for mechanical restrictions causing excessive load on the machine. |



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# Schematics



## Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

## Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the *Genie Z-30/20N Operator's Manual* on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

## About This Section

There are two groups of schematics in this section. An illustration legend precedes each group of drawings.

### Electrical Schematics

#### **⚠ WARNING**

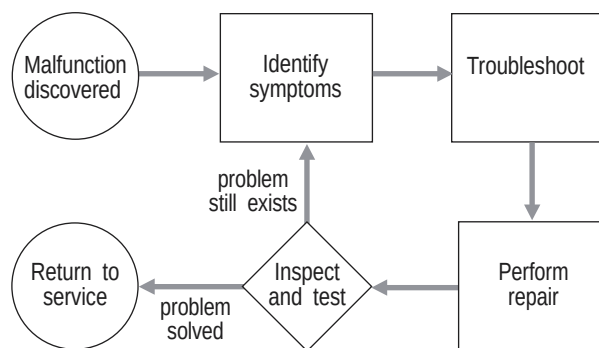
Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

### Hydraulic Schematics

#### **⚠ WARNING**

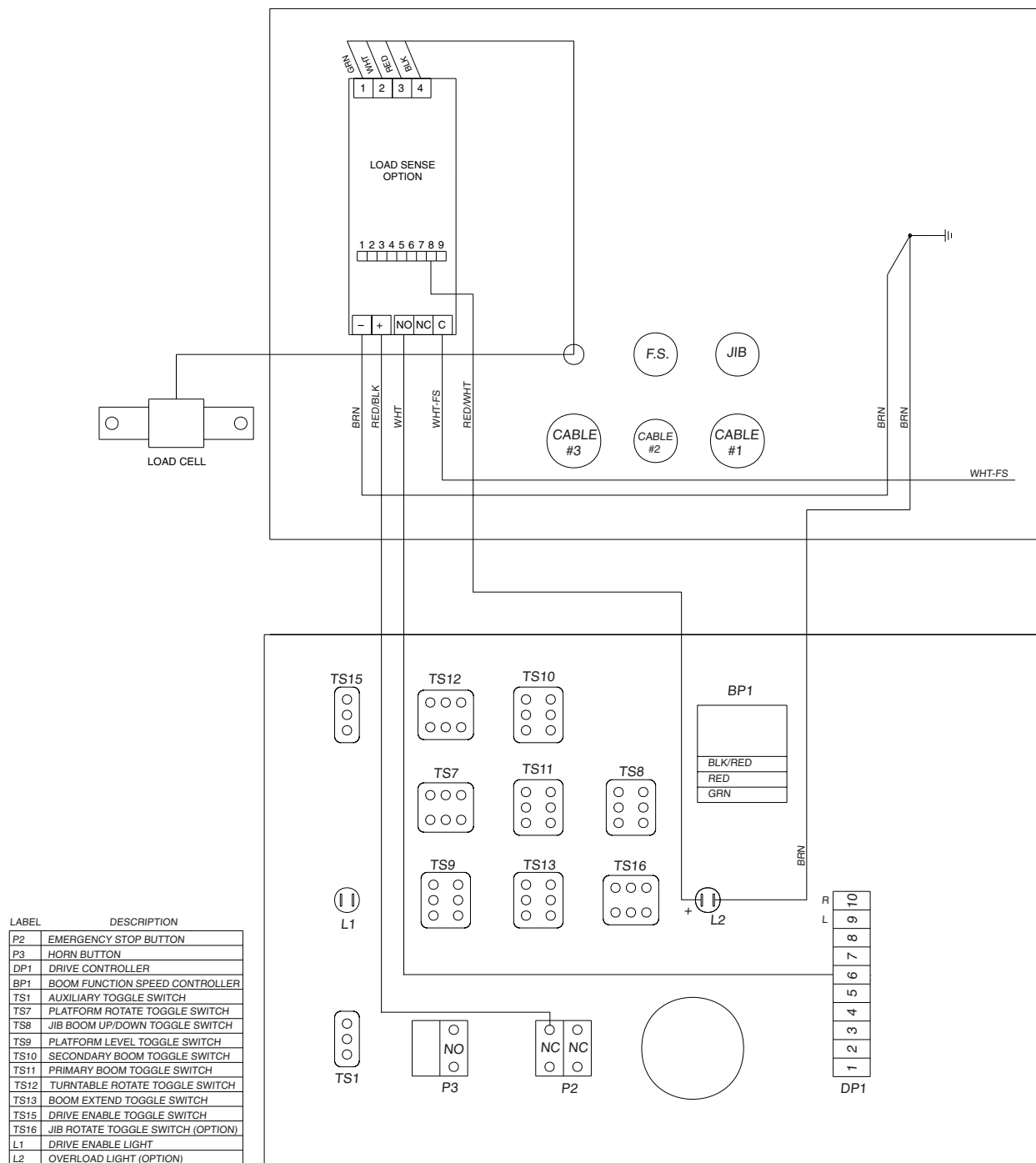
Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

### General Repair Process



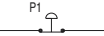
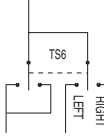
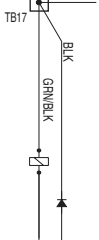
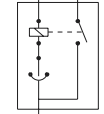
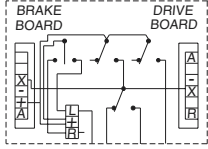
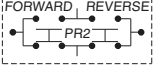
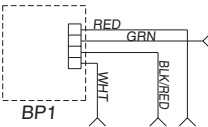
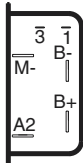
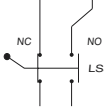
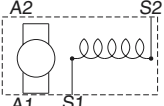
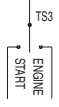
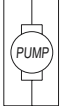
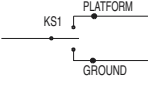
# Load Sensor Option Diagram (before serial number 6290)

REV A



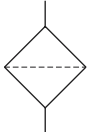
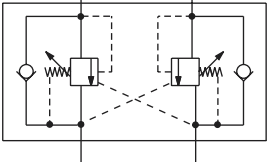
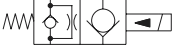
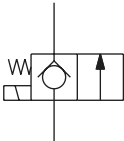
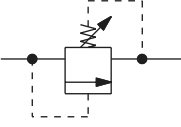
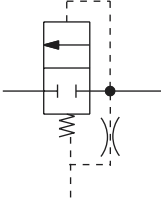
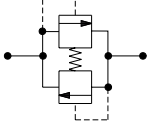
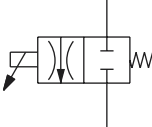
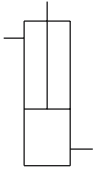
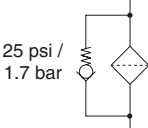
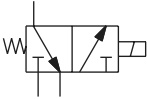
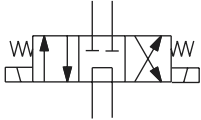
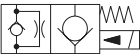
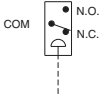
# Electrical Symbols Legend

REV A

|                                                                                                                            |                                                                                                                                |                                                                                                               |                                                                                                                                     |                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|  <p>Wire color with cable number</p>      |  <p>Emergency Stop button normally closed</p> |  <p>6V DC Battery</p>        |  <p>Toggle switch DPDT</p>                        |  <p>Horn button normally open</p>       |
|  <p>Terminal</p>                          |  <p>Ground suppression circuit</p>            |  <p>Light</p>                |  <p>Tilt sensor</p>                               |  <p>Foot switch</p>                     |
|  <p>Quick disconnect terminal</p>         |  <p>Circuit breaker</p>                       |  <p>Flashing beacon</p>      |  <p>Drive controller Joystick</p>                 |  <p>Pressure switch</p>                 |
|  <p>T-circuits connect at terminal</p>  |  <p>Dual pole relay</p>                     |  <p>Hour meter</p>         |  <p>Boom function speed controller</p>          |  <p>Horn</p>                            |
|  <p>T-circuits connect</p>              |  <p>Motor controller</p>                    |  <p>Brake release jack</p> |  <p>Limit switch</p>                            |  <p>Solenoid or relay coil</p>        |
|  <p>Connection no terminal</p>          |  <p>Drive motor</p>                         |  <p>Toggle switch SPDT</p> |  <p>Relay panel contactor</p>                  |  <p>Relay contact normally open</p>   |
|  <p>Circuits crossing no connection</p> |  <p>Auxiliary lift pump</p>                 |  <p>Key switch</p>         |  <p>Limit switch normally open held closed</p> |  <p>Relay contact normally closed</p> |
|  <p>Diode</p>                           |                                                                                                                                |                                                                                                               |                                                                                                                                     |  <p>Fuse</p>                          |

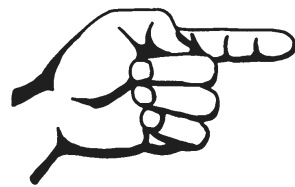
# Hydraulic Symbols Legend

REV A

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|    |    |   |  |
| Hydraulic filter                                                                    | Fixed displacement pump                                                             | 3000 psi /<br>207 bar<br>3:1<br>Counterbalance valve                                | Normally open poppet valve                                                          |
|    |    |                                                                                     |  |
| Check valve                                                                         | Solenoid operated dump valve                                                        |                                                                                     | 1.5 gpm /<br>5.7 L/min<br>Flow regulator valve                                      |
|    |   |   |                                                                                     |
| Orifice with size<br>0.045 /<br>1.14 mm                                             | 2800 psi /<br>193 bar<br>Relief valve with pressure                                 | Differential sensing valve                                                          |                                                                                     |
|  |  |  |                                                                                     |
| Brake                                                                               | 1100 psi /<br>75.8 bar<br>Dual relief valve with pressure                           | Solenoid operated proportional valve                                                |                                                                                     |
|  |  |  |                                                                                     |
| Double acting cylinder                                                              | 25 psi /<br>1.7 bar<br>Filter with by-pass                                          | Solenoid operated 2 position, 3 way directional valve                               |                                                                                     |
|  |  |  |                                                                                     |
| Pump prime mover (motor)                                                            | Solenoid operated 3 position, 4 way, directional valve                              | Normally closed poppet valve                                                        |                                                                                     |
|  |                                                                                     |                                                                                     |                                                                                     |
| Pressure switch                                                                     |                                                                                     |                                                                                     |                                                                                     |

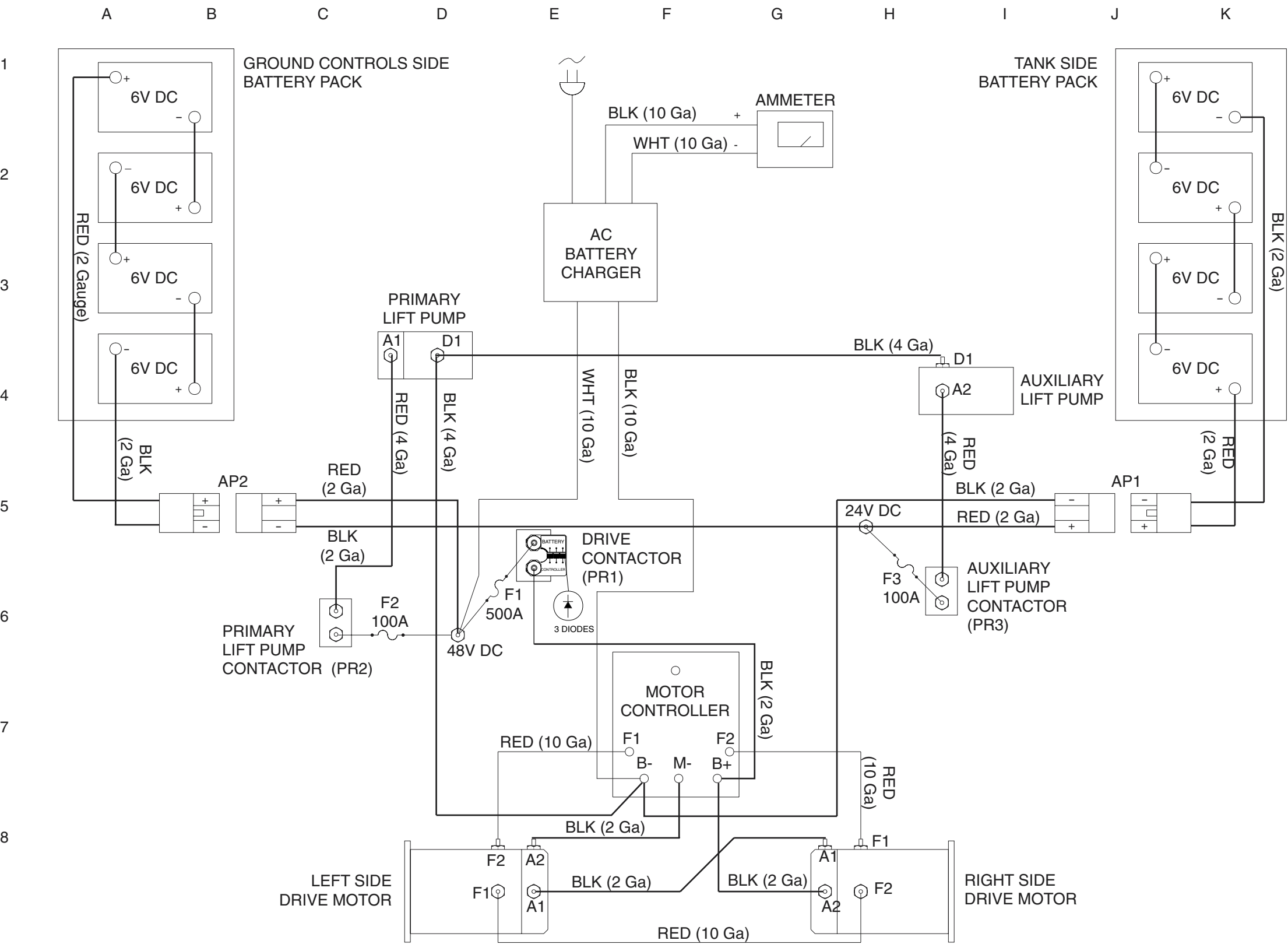
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**Power Cable Diagram  
(before serial number 6290)**



Power Cable Diagram  
(before serial number 6290)

REV A  
N



Power Cable Diagram  
(after serial number 6289)

REV B  
N

M

L

K

J

I

H

G

F

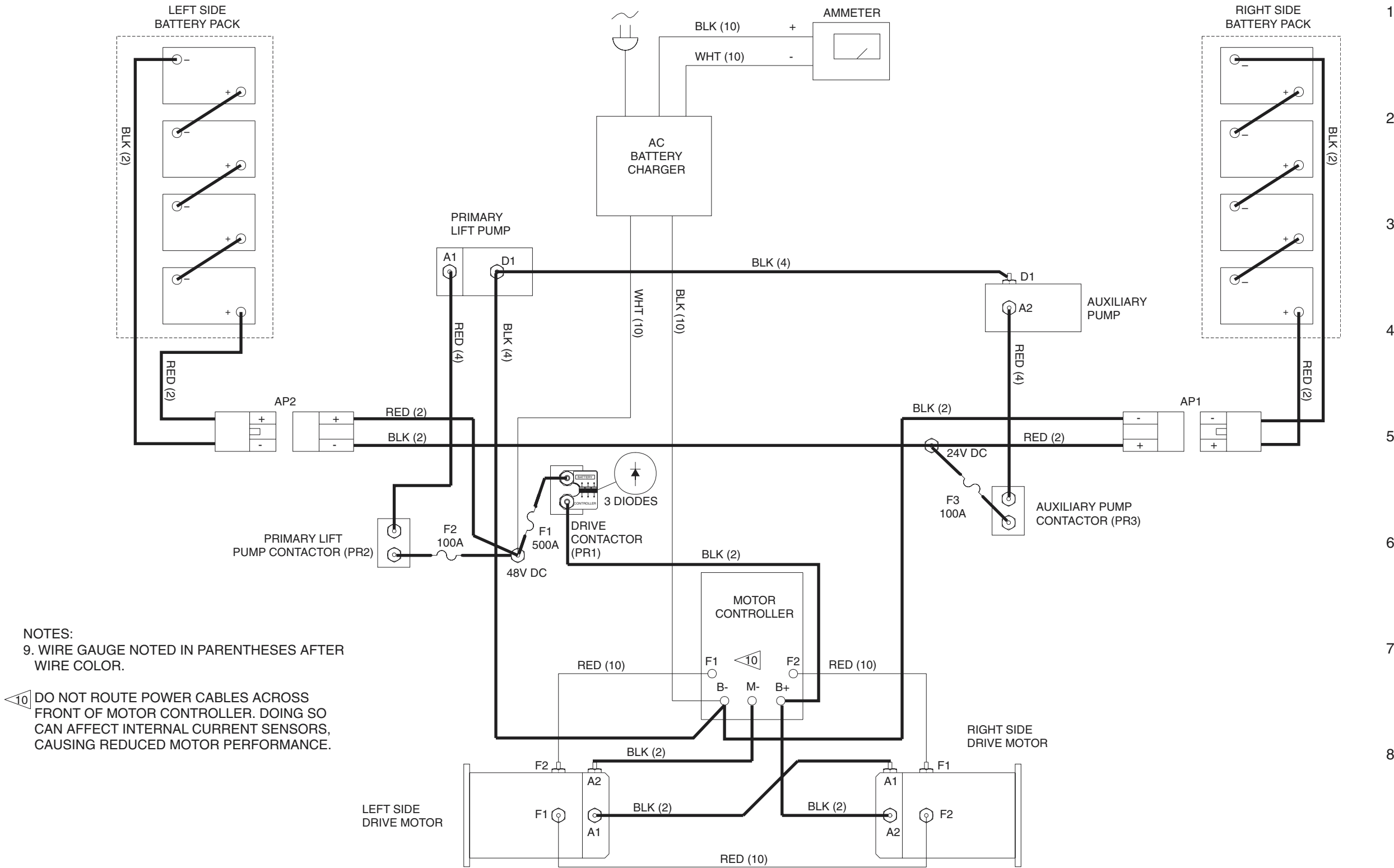
E

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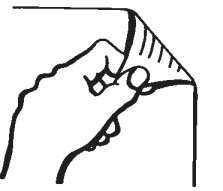
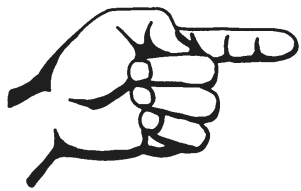


NOTES:  
9. WIRE GAUGE NOTED IN PARENTHESES AFTER WIRE COLOR.

10 DO NOT ROUTE POWER CABLES ACROSS FRONT OF MOTOR CONTROLLER. DOING SO CAN AFFECT INTERNAL CURRENT SENSORS, CAUSING REDUCED MOTOR PERFORMANCE.

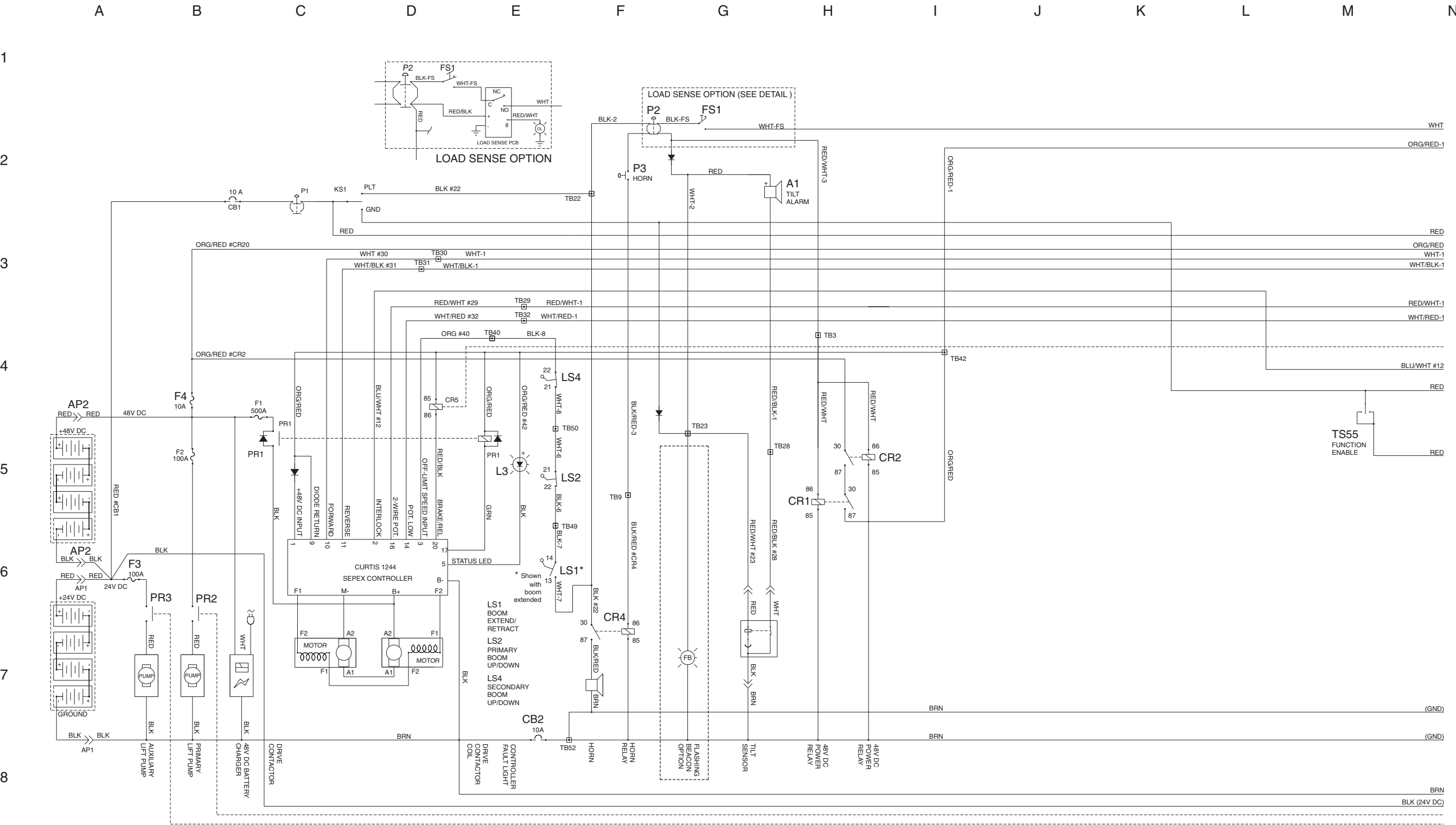
**Power Cable Diagram**  
**(after serial number 6289)**





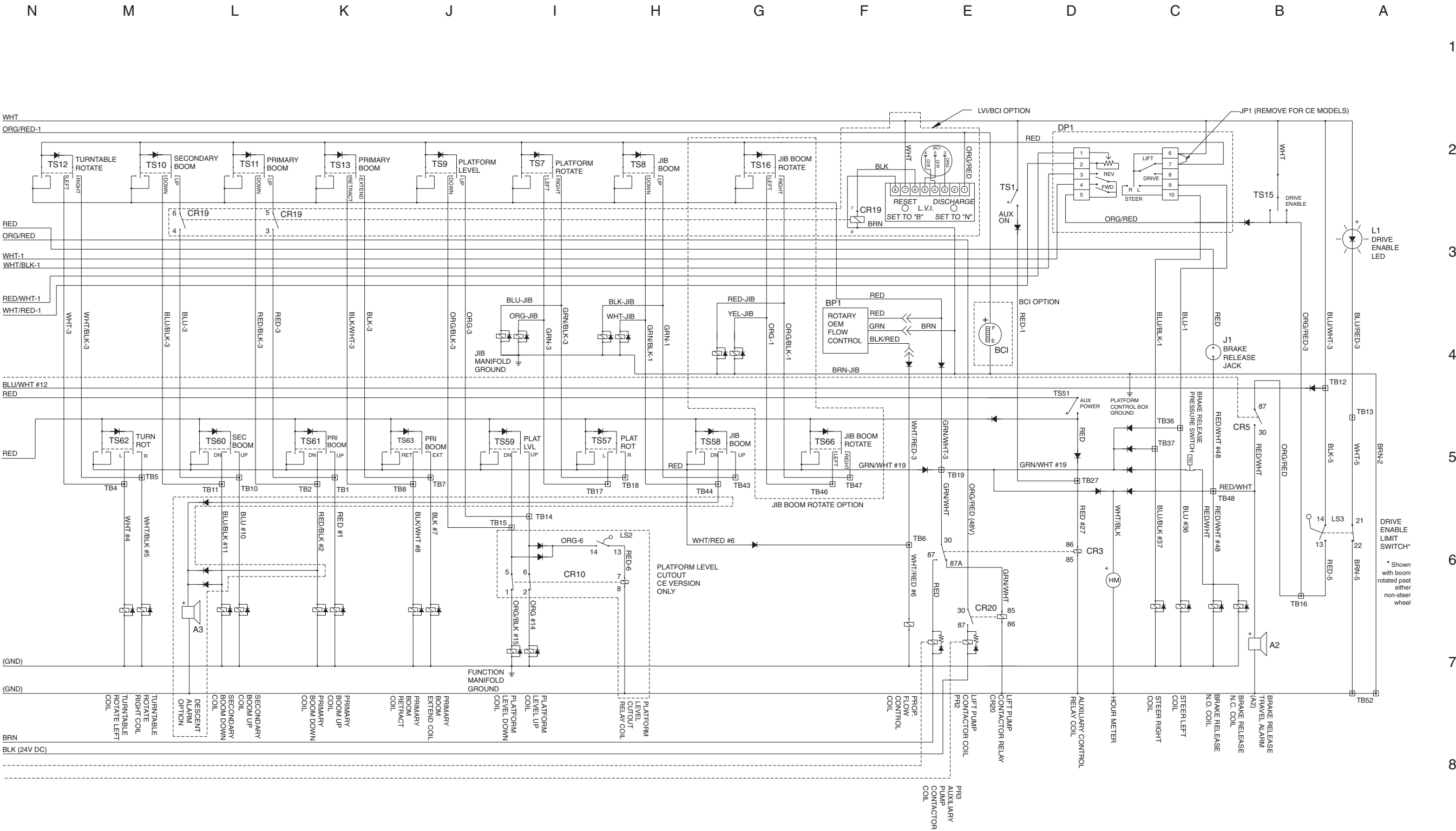
Electrical Schematic  
(before serial number 6290)

REV B



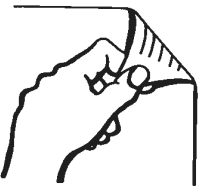
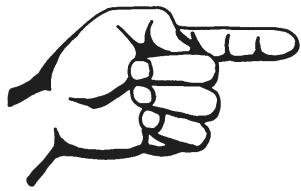
Electrical Schematic  
(before serial number 6290)

REV B



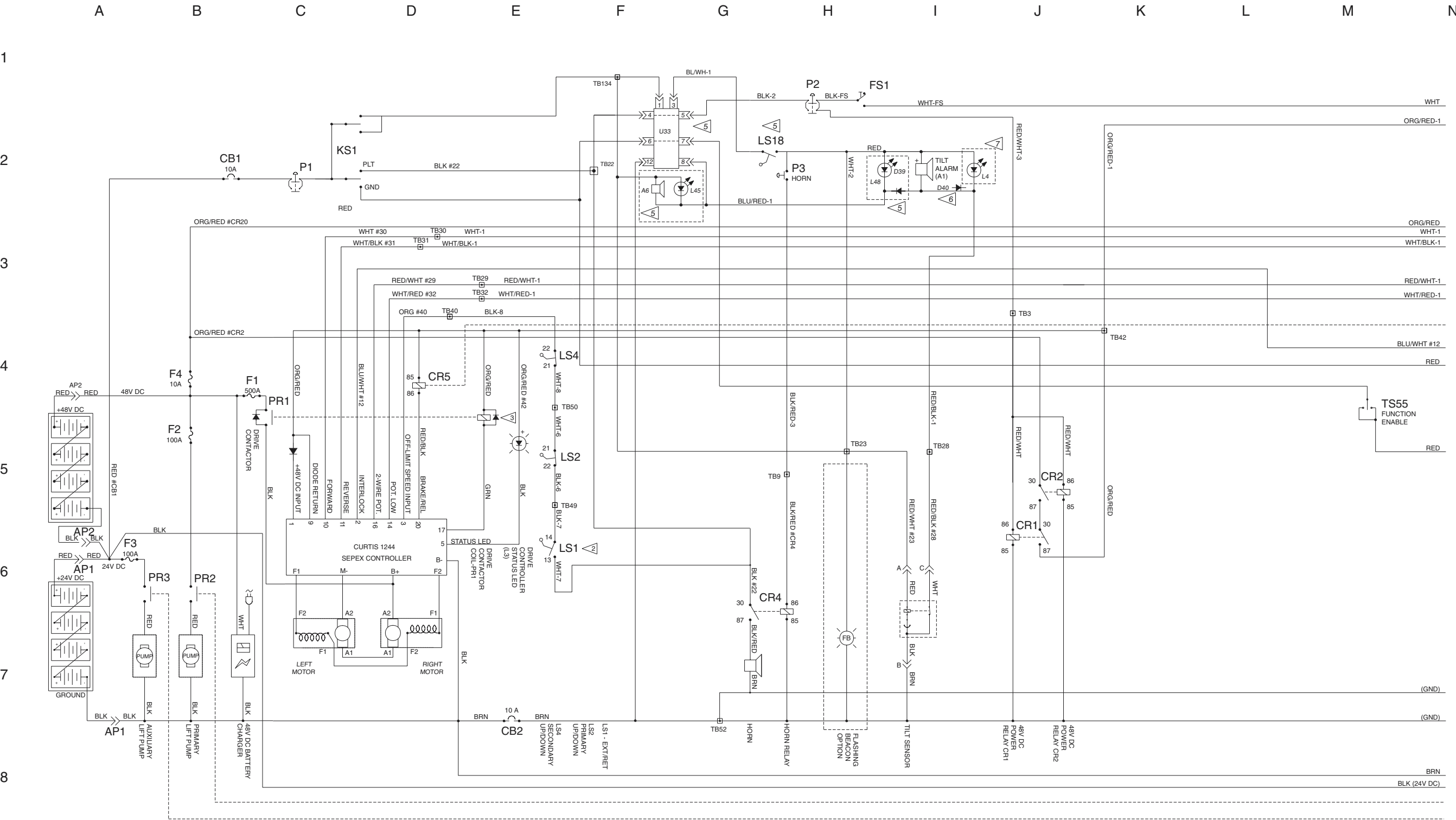
**Electrical Schematic**  
**(before serial number 6290)**





Electrical Schematic  
(after serial number 6289)

REV B



- NOTES:  
1. ALL LIMIT SWITCHES WITH BOOM IN STOWED POSITION EXCEPT AS NOTED  
2 SWITCH SHOWN WITH BOOM EXTENDED  
3 REDUNDANT COIL SUPPRESSION DIODE FOR PR1 IS INSIDE CONTROLLER BETWEEN J1-9 AND J1-17.
- 5 CE & PLATFORM LOAD SENSE OPTION.  
6 ADD D40 ONLY IF UNIT HAS BOTH L4 & L48.  
7 ANSI/CSA ONLY

### Electrical Schematic (after serial number 6289)

REV B

N

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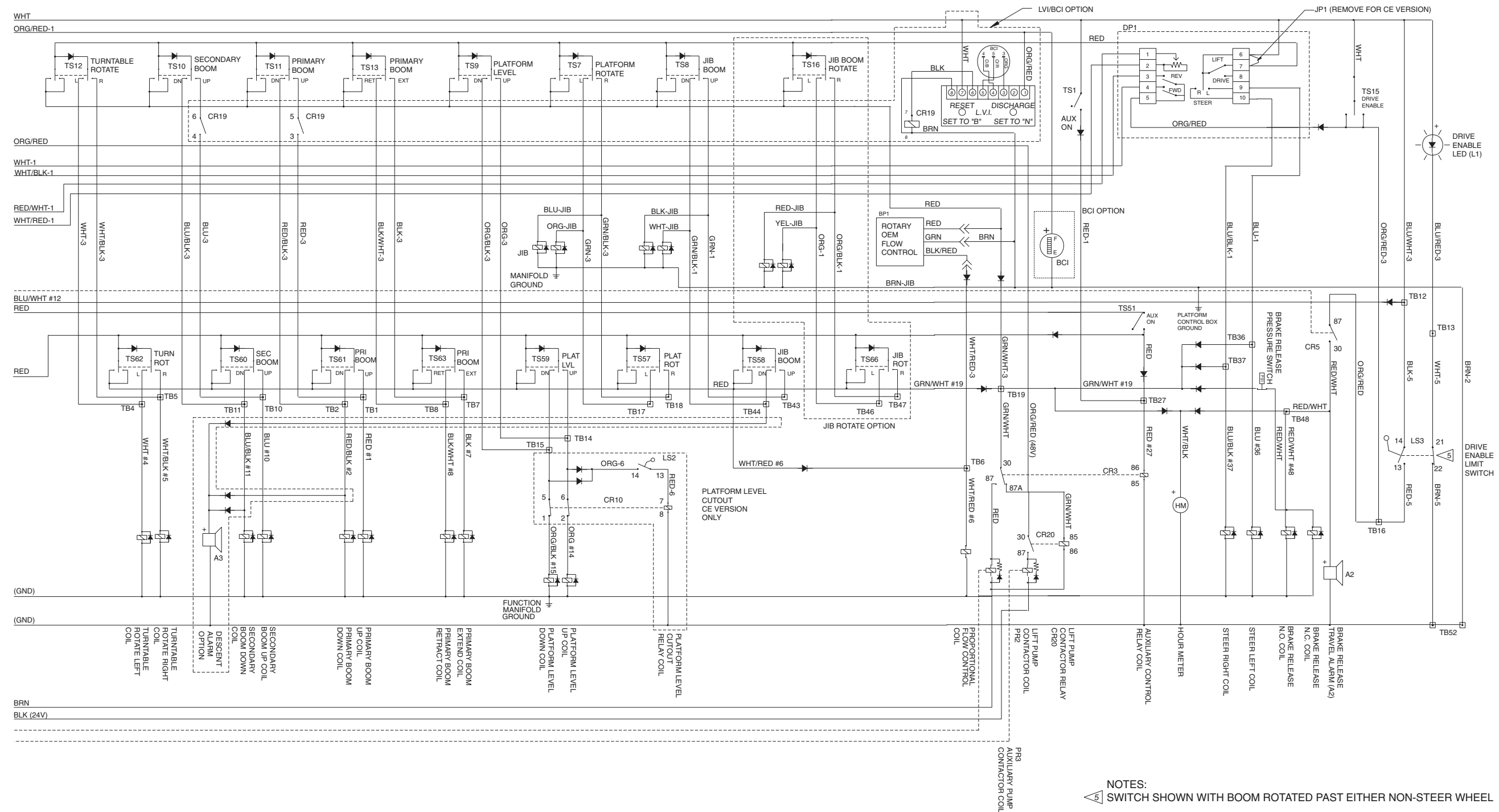
4

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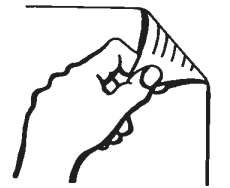
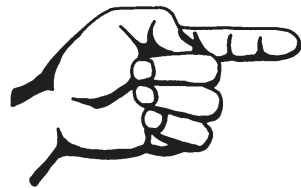
NOTES:  
5 SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL

**Electrical Schematic**  
**(after serial number 6289)**



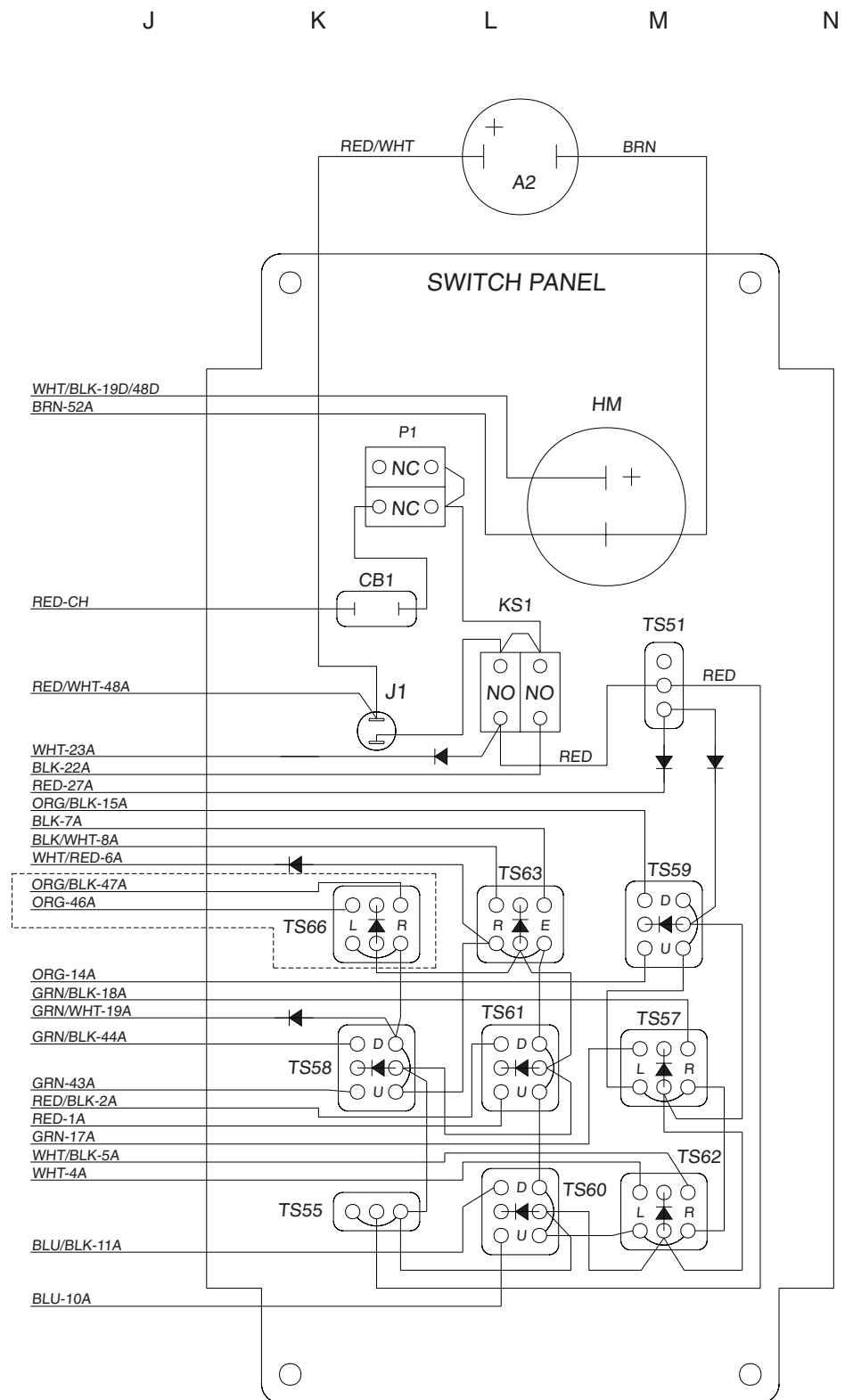
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**Ground Control Panel Wiring Diagram  
(before serial number 6290)**



## REV A

| LABEL | DESCRIPTION                            |
|-------|----------------------------------------|
| P1    | EMERGENCY STOP BUTTON                  |
| KS1   | KEY SWITCH                             |
| TS51  | AUXILIARY TOGGLE SWITCH                |
| TS55  | FUNCTION ENABLE TOGGLE SWITCH          |
| TS57  | PLATFORM ROTATE TOGGLE SWITCH          |
| TS58  | JIB BOOM UP/DOWN TOGGLE SWITCH         |
| TS59  | PLATFORM LEVEL TOGGLE SWITCH           |
| TS60  | SECONDARY BOOM UP/DOWN TOGGLE SWITCH   |
| TS61  | PRIMARY BOOM UP/DOWN TOGGLE SWITCH     |
| TS62  | TURNABLE ROTATE TOGGLE SWITCH          |
| TS63  | BOOM EXTEND/RETRACT TOGGLE SWITCH      |
| TS66  | JIB BOOM ROTATE TOGGLE SWITCH (OPTION) |
| CB1   | CIRCUIT BREAKER, CONTROLS, 10A         |
| CB2   | CIRCUIT BREAKER, CONTROLS RETURN, 10A  |
| J1    | BRAKE RELEASE JACK                     |
| HM    | HOURLMETER                             |
| CH    | CHASSIS HARNESS                        |
| MH    | MANIFOLD HARNESS                       |
| SP    | SWITCH PANEL                           |
| CR    | CONTROL RELAY                          |
| A2    | BRAKE RELEASE/TRAVEL ALARM             |
| A3    | DESCENT ALARM (OPTION)                 |
| L3    | CONTROLLER STATUS LED                  |



### CONTROL RELAY I.D.

CR1 - SECONDARY 48V DC POWER  
CR2 - PRIMARY 48V DC POWER  
CR3 - AUXILIARY PUMP  
CR4 - HORN  
CR5 - BRAKE RELEASE  
CR10A - PLATFORM LEVEL CUTOUT (CE ONLY)  
CR10B - PLATFORM LEVEL CUTOUT (CE ONLY)

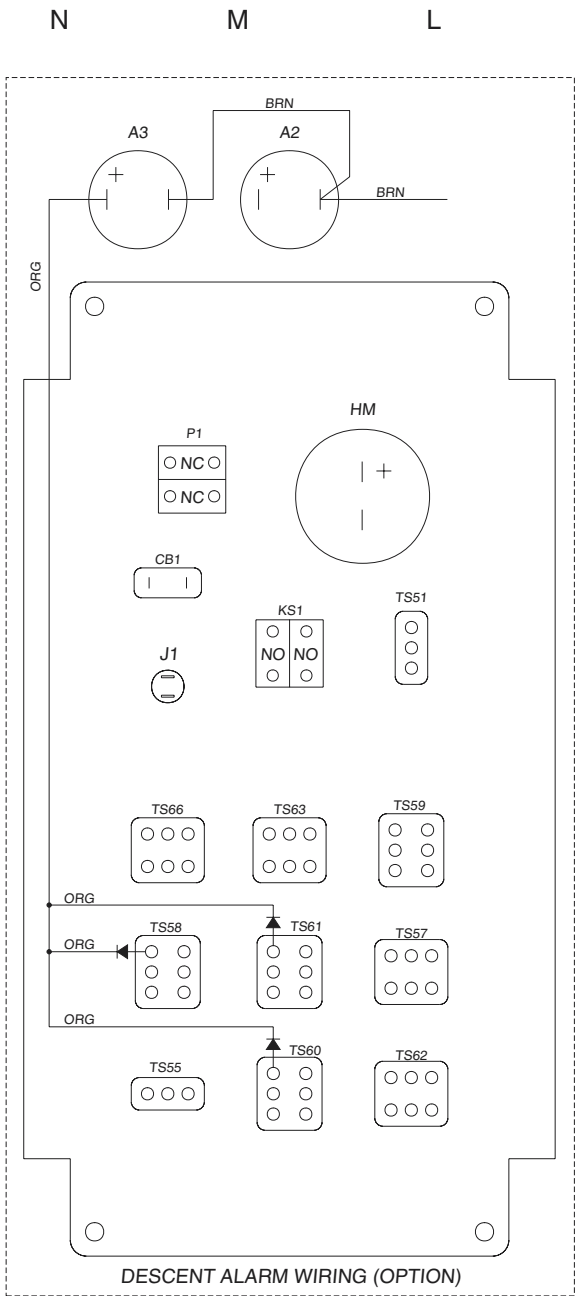
### OPTION NUMBERS

---

1 - PLATFORM LEVEL CUTOUT  
2 - FLASHING BEACON  
3 - DESCENT ALARM

Ground Control Panel Wiring Diagram  
(after serial number 6289)

REV A



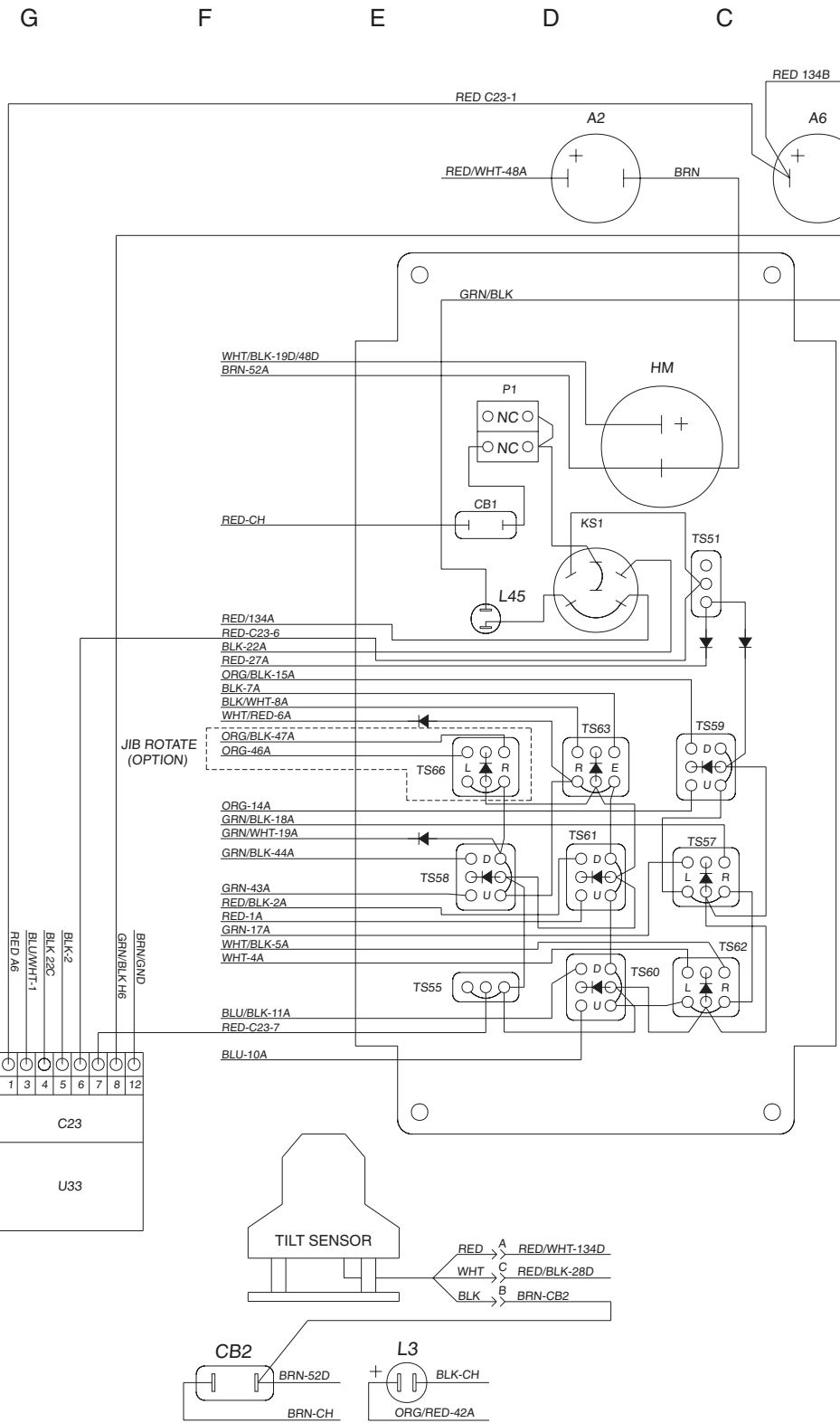
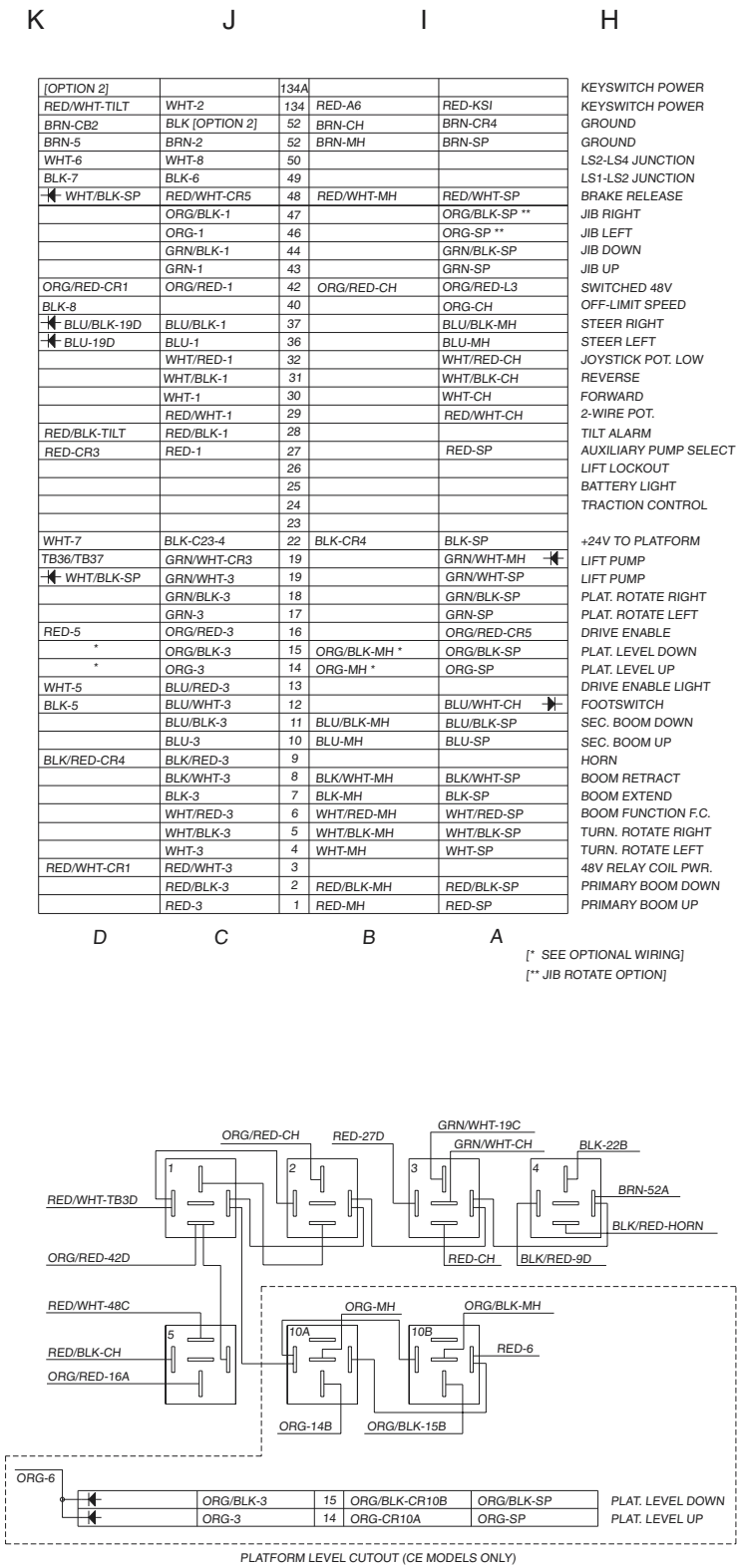
- CONTROL RELAY I.D.**

  - CR1 - SECONDARY 48V DC POWER
  - CR2 - PRIMARY 48V DC POWER
  - CR3 - AUXILIARY PUMP
  - CR4 - HORN
  - CR5 - BRAKE RELEASE
  - CR10A - PLATFORM LEVEL CUTOUT (CE ONLY)
  - CR10B - PLATFORM LEVEL CUTOUT (CE ONLY)

**OPTION NUMBERS**

  - 1 - PLATFORM LEVEL CUTOUT
  - 2 - FLASHING BEACON
  - 3 - DESCENT ALARM
- SPARE WIRE LIST**

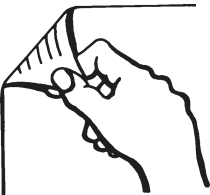
  - BLK-1
  - BLK/WHT-1
  - BLK/RED-1
  - GRN/WHT-1



SWITCH PANEL

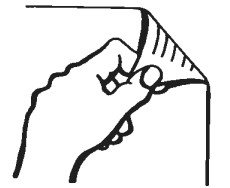
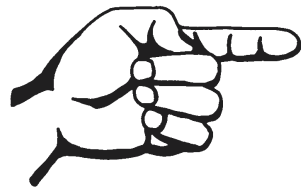
| LABEL | DESCRIPTION                            |
|-------|----------------------------------------|
| A2    | BRAKE RELEASE/TRAVEL ALARM             |
| A3    | DESCENT ALARM (OPTION)                 |
| A6    | PLATFORM OVERLOAD ALARM (CE MODELS)    |
| CB1   | CIRCUIT BREAKER, CONTROLS, 10A         |
| CB2   | CIRCUIT BREAKER, CONTROLS RETURN, 10A  |
| CH    | CHASSIS HARNESS                        |
| CR    | CONTROL RELAY                          |
| HM    | HOURLMETER                             |
| J1    | BRAKE RELEASE JACK                     |
| KS1   | KEY SWITCH                             |
| L3    | CONTROLLER STATUS LED                  |
| L45   | PLATFORM OVERLOAD LED (CE MODELS)      |
| MH    | MANIFOLD HARNESS                       |
| P1    | EMERGENCY STOP BUTTON                  |
| SP    | SWITCH PANEL                           |
| TS51  | AUXILIARY TOGGLE SWITCH                |
| TS55  | FUNCTION ENABLE TOGGLE SWITCH          |
| TS57  | PLATFORM ROTATE TOGGLE SWITCH          |
| TS58  | JIB BOOM UP/DOWN TOGGLE SWITCH         |
| TS59  | PLATFORM LEVEL TOGGLE SWITCH           |
| TS60  | SECONDARY BOOM UP/DOWN TOGGLE SWITCH   |
| TS61  | PRIMARY BOOM UP/DOWN TOGGLE SWITCH     |
| TS62  | TURNABLE ROTATE TOGGLE SWITCH          |
| TS63  | BOOM EXTEND/RETRACT TOGGLE SWITCH      |
| TS66  | JIB BOOM ROTATE TOGGLE SWITCH (OPTION) |
| U33   | PLATFORM OVERLOAD MODULE (CE MODELS)   |

**Ground Control Panel Wiring Diagram  
(after serial number 6289)**



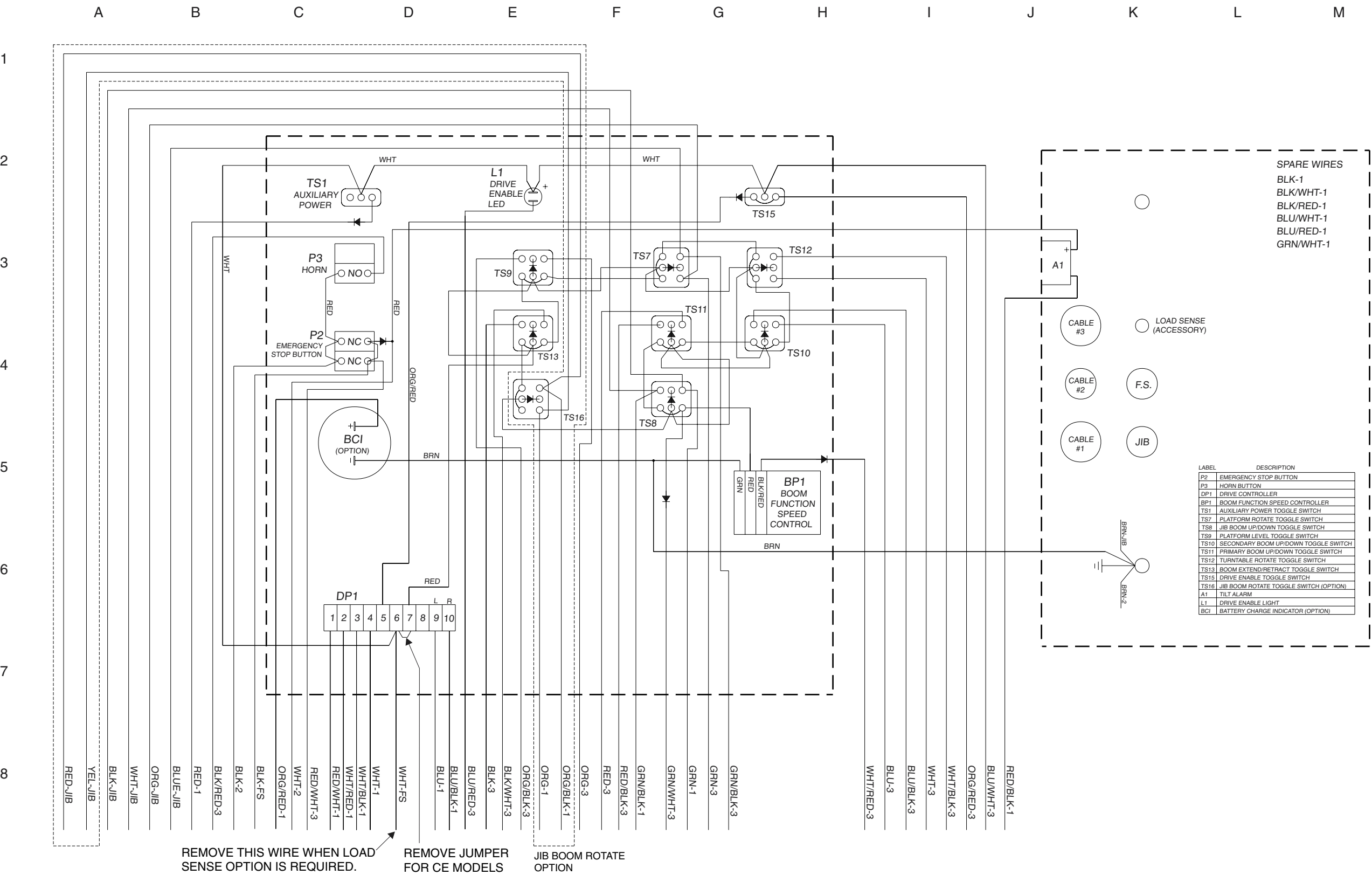
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**Platform Control Box Wiring Diagram  
(before serial number 6290)**



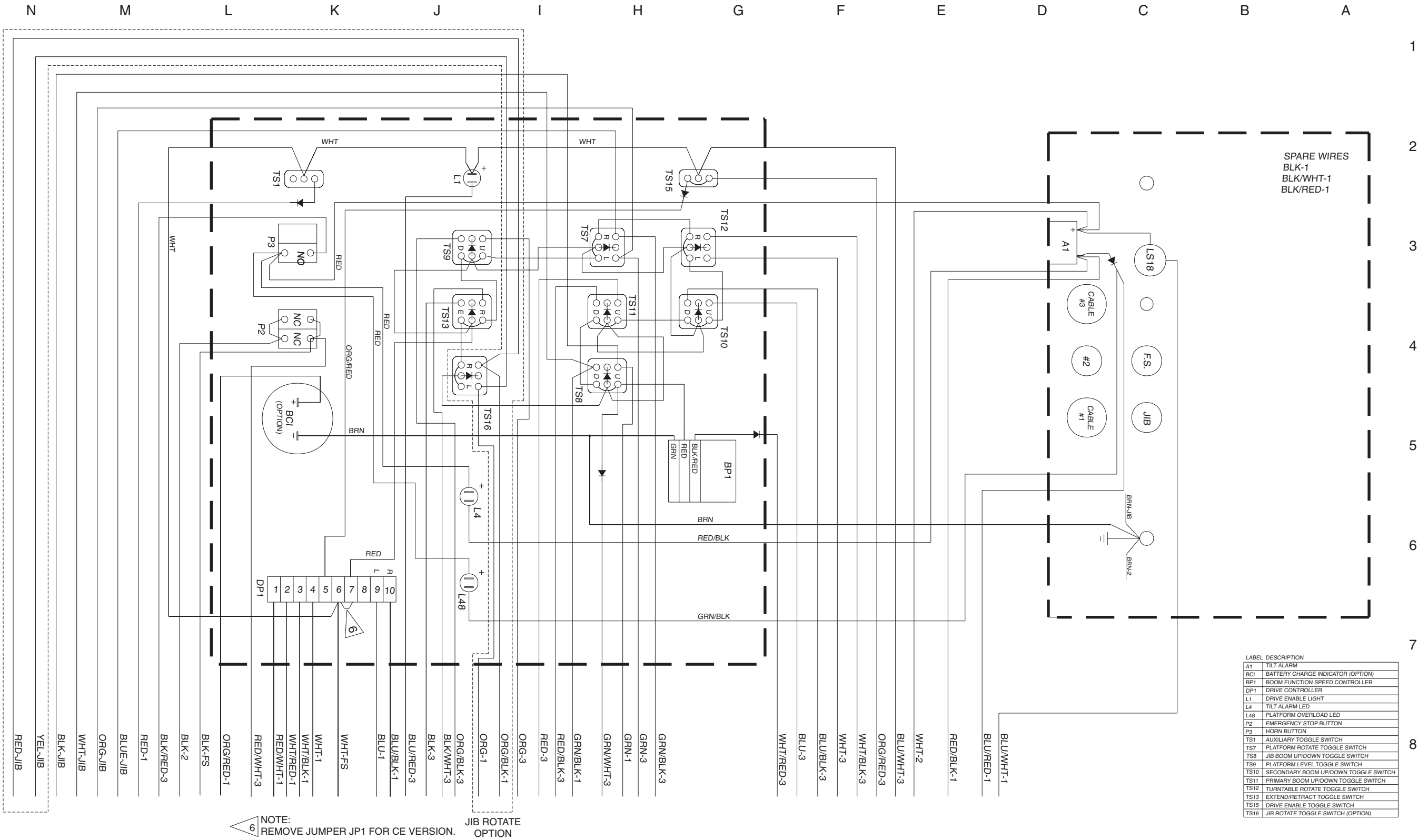
Platform Control Box Wiring Diagram  
(before serial number 6290)

REV A  
N



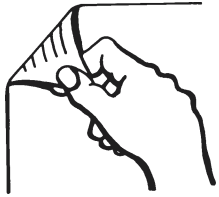
Platform Control Box Wiring Diagram  
(after serial number 6289)

REV A



---

## Platform Control Box Wiring Diagram (after serial number 6289)



Power Panel Wiring Diagram

REV A  
N

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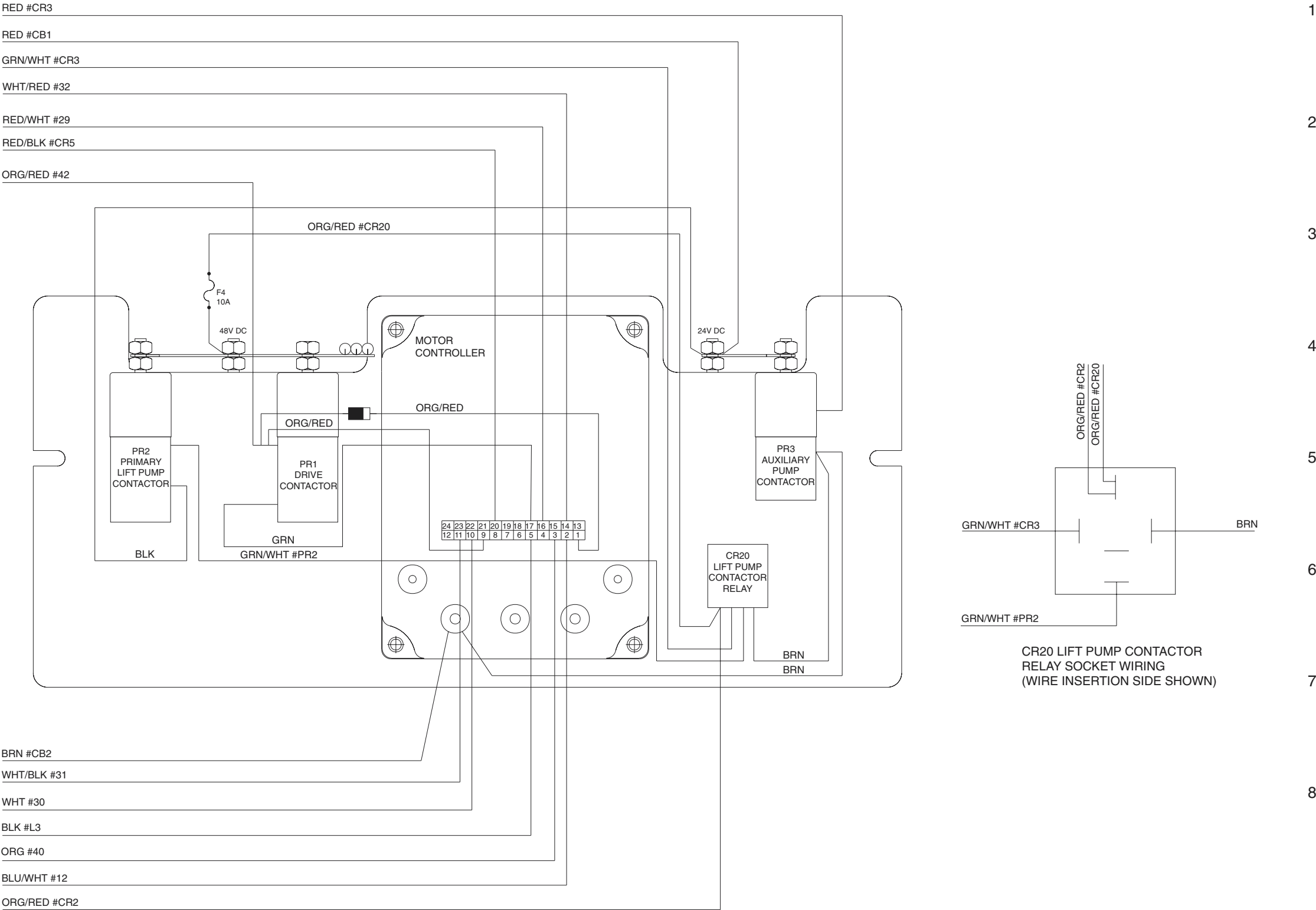
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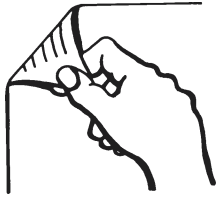
B

A



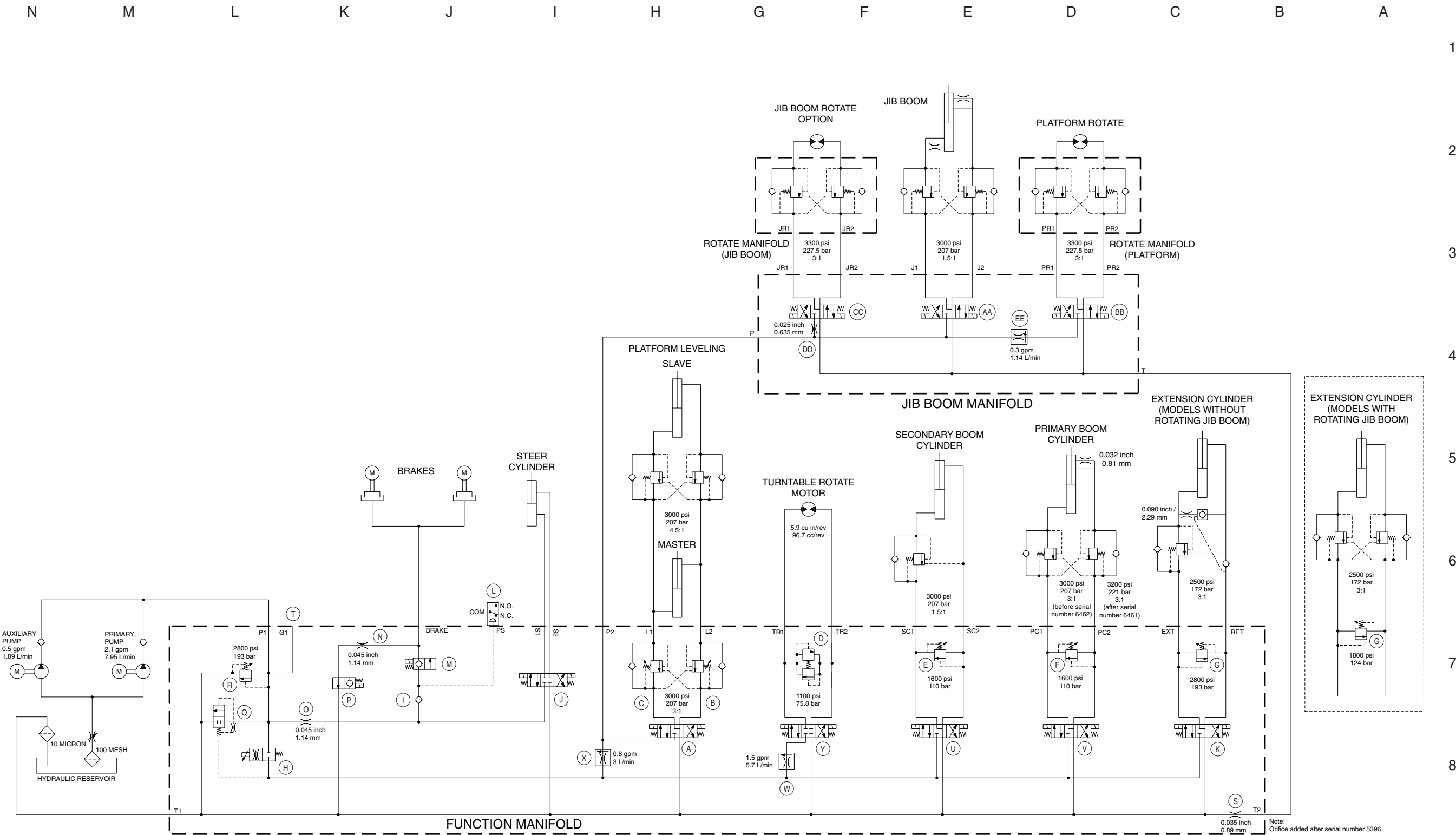
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## Power Panel Wiring Diagram



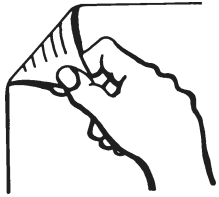
Hydraulic Schematic

REV A



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## Hydraulic Schematic



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